SUSTAINABLE URBAN DEVELOPMENT IN HISTORIC CAIRO

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Thesis submitted to the University of Nottingham for the degree of Doctor of Philosophy

July 2013

To my late parents....

and my beloved country ... Egypt

Abstract

Heritage is a constituent of the cultural tradition, and an important component of societal and community welfare. This comprehensive vision merges both tangible and intangible dimensions; architectural and historical values. As a result of globalisation, local communities of heritage sites have started to realise the significance of their influencing voices in shaping their lives and futures. Several rehabilitation and development initiatives have been selected for this study to review lessons learned from a variety of methodologies adopted for different historical districts of distinctive urban, political, and socio-economic contexts.

Historic Cairo is home to the largest concentration of Islamic monuments in the world and was designated a world heritage site in 1979. Despite historic Cairo's international and national significance, it is highly vulnerable to negligence and deterioration as a consequence of modernisation and rapid changes in urban and cultural lifestyles. Historic Cairo has attracted numerous rehabilitation, preservation and restoration studies, proposals, and projects through governmental, national, and international efforts. These rehabilitation schemes however have lacked the sustainable urban development delivery in this heritage context. Moreover, most of the schemes neglected yet another significant dimension for sustainable urban development considered key to many successful schemes; community participation and involvement in the planning process. The study aims to fill the research gap identified to achieve sustainable urban development in historic Cairo.

Thus, a thorough, evidence-based, and theoretically informed methodology has been proposed for developing a tailored intervention that attempts to tackle some of the most critical problems in historic Cairo. The present study adopts a mixed-method strategy with an in-depth case study to undertake a comprehensive analysis of the research problem. This mixed methodology has had the benefit of combining data collection techniques, interviews and questionnaire in order to explore more fully the context of the case study. The combination of methods has provided a basis for exploring how community participation plays a vital role in the success (or failure) of the delivery of a

development intervention in historic Cairo. Results from questionnaires and interviews have provided a robust vision of how the bottom-up and top-down views complement each other to provide a foundation for the researcher to build the proposed intervention on. The analysed results are to provide recommendations to decision makers on how best to encourage and incorporate stakeholders' views in future interventions implemented within their rich historic context. Drawing from the survey results along with lessons learnt from other development initiatives in heritage sites, and complementing this with space syntax analysis techniques, a set of tailored design guidelines is generated for sustainable development in historic Cairo.

The proposed design guidelines comprise recommendations that have dealt with the five main urban zones of historic Cairo based on the most critically required design principles for sustainable development; diversity and choice, distinctiveness/sense of place, users' needs, self sufficiency/participation, and pollution reduction. The proposed strategy has aimed to consider the development of the physical urban context of historic Cairo whilst enhancing the social, economic, and environmental aspects within the local community to guarantee the sustainable delivery and outcomes of the intervention.

Acknowledgments

I am greatly indebted to my supervisors Prof. Tim Heath and Dr. Stephen Platt for their extensive support, guidance, and patience during this research. This research would never been possible without their critical comments and constructive opinions. I would like to express my gratitude to Prof. Peter Larkham and Dr. Didem Ekici, my examiners, whose comments helped improve this study. I am grateful to the University of Nottingham's Urban Design Research Group, the Department of Architecture, and Built Environment for the financial support in my four-month internship at Space Syntax Limited, London. I also owe the International Office at the University of Nottingham appreciation for offering me a partial scholarship for my PhD.

I would also like to express my gratitude to many people who helped me during my fieldwork research in historic Cairo, Egypt and who have spent valuable time to be interviewed: Prof. Ayman El Hefnawi (Vice-Chairman, GOPP), Prof. Sohair Hawas (deputy chief at NOUH), Prof. Abbas El-Zafarany (NOUH's Supervisor of Central Administration for Policies), Prof. Saleh Lamei (Director of the CIAH), Dr. Tariq Al Murri, Dr. Ashraf Botros, Dr. Adli Bishay and Dr. Asaad Nadim. I also appreciate the support of Raman Aras, Ed Parham and Dr Kayvan Karimi during my internship at Space Syntax Limited, London.

Special thanks to my friends both in Cairo and in Nottingham and all my PhD colleagues at the University of Nottingham whom enriched my research through constructive discussions. I would like to take this opportunity to thank all the members of the Egyptian Society at the UoN and Nottingham Usrah for providing us with another family in Nottingham.

Finally, I would like to acknowledge my family for their understanding, and support with a very special appreciation to my late mother who has always provided me with advice and support. I am deeply indebted to my wife and colleague Heba for being endlessly patient, encouraging, and supportive. I have to acknowledge my daughter Hania, and my son Ahmed for their continuous encouragement and company during the past few years. I hope they would forgive me for not fulfilling all my obligations towards them.

Haitham Rashed.....

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List of Acronyms and Abbreviations

ABDC:	The Arab Bureau of Design and Technical Consultations
ADB:	Asian Development Bank
ADAA:	Al-Darb Al-Ahmar
AKAA:	Aga Khan Award for Architecture
AKAM:	Aga Khan for Micro-Credit
AKCS-E	Agha Khan for Cultural Services- Egypt
AKDN:	Aga Khan Development Network
AKTC:	Aga Khan Trust for Culture
ARCE:	American Research Centre in Egypt
AUDIC:	Association for the Urban Development of Islamic Cairo
CAPMAS:	Central Agency for Public Mobilization and Statistics
CDC:	Community Development Company- NGO, Egypt
CG:	Cairo Governorate
CIAH:	Center for Conservation and Preservation of Islamic Architectural Heritage
DEFRA:	Department for Environment, Food and Rural Affairs, UK
DOC:	Directorate of the Old City, Aleppo, Syria
EA:	Enumeration Area
FCDA:	Fatimid Cairo Development Agency-NGO, Egypt
FEDA:	Friends of Environment Development Association, Al-Darb Al-Asfar-NGO
GCMR:	Greater Cairo metropolitan region
GIS:	Geographic Information System
GOPP:	General Organization for Physical Planning
GIZ:	Deutsche Gesellschaft für Internationale Zusammenarbeit (German Society for International Cooperation)
HBRC:	Housing and Building Research Centre, Egypt
HCP:	Historic Cities Programme- Aga Khan
HCRP:	Historic Cairo Restoration Project
HCSDC:	Historic Cairo Studies & Development Centre
HDI:	Human Development Index
IAURIF:	Institut d'Amènagement Urbain et Regional d'Ille de France
ICCROM:	International Centre for the Study of the Preservation and Restoration of Cultural Property
ICOMOS:	International Council on Monuments and Sites

IDSC:	Information and Decision Support Center
IECS	Income, Expenditure, and Consumption Survey
JDURC:	Jeddah Development and Urban Regeneration Company
MCSLC:	Misr Company for Sound, Light, and Cinema
MOA:	Ministry of Awqaf/ Religious endowment, Egypt
MOC:	Ministry of Culture, Egypt
MOE:	Ministry of Education, Egypt
MOF:	Ministry of Finance, Egypt
MOHUUD:	Ministry of Housing, Utilities and Urban Development, Egypt
MOI:	Ministry of Interior, Egypt
MOT:	Ministry of Transportation, Egypt
NAT:	National Authority for Tunnels, Egypt
NGOs:	Non Governmental Organizations
NOUH:	National Organization for Urban Harmony, Egypt
OWHC:	Organisation of World Heritage Cities
OECD:	Organisation for Economic Cooperation and Development
PSUs	Primary Sampling Units
SCA:	Supreme Council of Antiquities- Ministry of Culture, Egypt
SCTA:	Saudi Commission for Tourism & Antiquities, Kingdom of Saudi Arabia
SDAG:	Sustainable Development Association for Gamaliya, Egypt
SFD:	Social Fund for Development, Egypt
SSx:	Space Syntax
UN-HABITAT:	United Nations Human Settlements Programme
UNESCO:	United Nations Educational, Scientific and Cultural Organisation
UNDP:	United Nations Development Programme
USAID:	United States Agency for International Development
WB:	World Bank
WCED:	World Commission on Environment and Development
WHC:	World Heritage Convention

Glossary

Al-Qahira:	Cairo
Bab:	Gateway
Caliph:	Spiritual leader of Islam
Darb:	Street sectioned off with gates which close a neighbourhood
Enumeration Area:	Small area composed mainly of one Primary Sampling Unit (PSU) or sometimes less according to the number of dwellings and inhabitants, specified for general censuses and other statistical surveys
Hammams:	Public baths
Kuttab:	Elementary religious schools for the teaching of Quran
Madrasa:	An educational institution equivalent to a college/school
Sabil:	Public fountain
Stratified sample:	Every member of the population in this area has an equal chance of being selected in relation to their proportion within the total population. However, it adds some boundaries to the process of selection basis on specific identity or purpose.
Stucco:	is a material made of an aggregate, a binder, and water
Preservation:	Focuses on the maintenance stabilization, and repair of existing historic materials and retention of a property's form as it has evolved over time.
Restoration:	Returning the building or the urban fabric to its original state. It is the strongest level of intervention and involves complete rebuilding of one element. This approach does not allow for full integration of the restored area into modern urban life. But it is required when we deal with monuments and historic buildings.
Rehabilitate:	Less restrictive approach for dealing with historic fabric as it targets re-using the building or the whole area for the same old use or for some modern use with minimum intervention in the physical layout and features.
Maintain/Adaptive re-use:	Maintaining most of the physical features of the building or heritage urban site. It is the lowest level of intervention, and this describes work such as maintenance of property
Wakalas:	Designed as an inn or motel for accommodating traders coming from all parts of the globe as well as a marketplace for trading goods and a venue for making trade deals.

CHAPTER ONE

INTRODUCTION

Chapter Contents

1.1 SETTING THE SCENE

1.1.1 Deficiencies of Egyptian planning policies

The recent revolution that overwhelmed Egypt on 25 January 2011 was an attempt to resist and condemn corruption, injustice, and neglect of the citizens in the planning process of decision making. People have been suffering for decades from bureaucratic corruption, bullying, manipulation and brutality of the police forces. This non-violent revolution intended to improve the quality of life by uniting all people under one main slogan; Food, Freedom, and Human Dignity for all. In addition, the underpinning ethos of the 'Lotus Revolution' as it became known was grounded in the aspirations for a better and more prosperous livelihood for the present and future generations. Egypt has endured long decades of dictatorship; resources stolen, people neglected and alienated, and basic needs both inadequate and scarce. Inappropriately designed policies have been mostly implemented and have rarely kept pace with the ever-changing socio-economic and political transformations.

Egyptians have suffered from the State of Emergency Law No. 162 of 1958 since 1967 - except for an 18-month break in 1980 after which it was reactivated following the assassination of President Anwar Sadat. The Law strictly bans any non-governmental political activity: street demonstrations, and non-approved political organisations. Even unregistered financial donations are formally banned. In addition, ratifying Law 32 of 1964 that seriously impedes the formation and performance of voluntary associations hindered any potential schemes for development.

Another major problem that Egyptians have been facing is the unreasonable inflation in the housing stock for nearly the past two decades. Rent control legislation has been applied in Egypt as a means of reducing inflationary prices of housing stock and thereby maintaining the affordability of the housing stock to lower- and middle-income classes. The rent control in Egypt has failed to attain this goal and in fact has brought about the opposite, where rental rates have increased drastically. Attempts to legally regulate the relationship and responsibilities between the landlords and tenants have always tended to fail. As a result of this legislation, absent landlords do not maintain their tenant-

occupied houses. Residents of low income and poor status are more concerned with their employment opportunities and livelihood and less with the deterioration of their home conditions (Bianca & Jodidio, 2007; UNDP & SCA, 1997).

This is particularly clear in heavily populated areas, such as historic Cairo, the case study of this research. Historic Cairo includes the greatest concentration of Islamic monuments in the world, both in quality and quantity. Its distinctive array of monuments includes mosques, mausoleums, Kuttab (religious schools), public baths, palaces, houses, city gates and 'Wakalas', built by prominent patrons, between the seventh and nineteenth centuries (AKTC, 2005b; UNDP & SCA, 1997). The population growth, combined with the high numbers of visitors and tourists have led to a more chaotic state in the condition of the monuments in the past few decades than following hundreds of years of natural erosion (UNESCO, 2012; Sedky, 2009; UNDP & SCA, 1997). Another important factor that caused severe deterioration of historic Cairo was the 1992 earthquake that seriously affected monuments and historic buildings (Fahmi & Sutton, 2003).

Conflicts between the two main bodies responsible for Egypt's heritage, the Supreme Council of Antiquities (SCA) and the Ministry of Awqaf (religious endowments) have resulted in disordered outcomes regarding the fate of Egypt's Islamic monuments (El-Aref, 2008). The slow and inappropriate planning to recover after the earthquake disaster increased the numbers of deteriorated buildings and raised the threat of illegal encroachment, as well as theft and vandalism of the built heritage. Unfortunately, some monuments in historic Cairo have recently been struck by a series of damaging thefts and acts of vandalism. Many unique and precious objects have been stolen from mosques and other significant monuments (Fahmi & Sutton, 2003; SCA, 2002; UNDP & SCA, 1997).

The Egyptian planning policies have failed to deal with the needs of their residents; thus many areas have lost their identity and character (UNDP& SCA, 1997). Moreover, the management system is fragmented, which implies that any united and equitable administrative decision has to be taken at the local authority level (SCA, 2002). In order to ensure the creation and upkeep of a

sustainable environment in historic Cairo, it is necessary to review its planning policies and develop a clear understanding of all the factors that have contributed to the present condition of historic Cairo. Stakeholders' views, interests, and aspirations need to be addressed in all future mechanisms for rehabilitation schemes in historic areas. The impact of facilitating the involvement of locals in decision-making is to attain the long-term sustainability and stability in political, social, cultural, and urban aspects. Planners should no longer act as technical experts, nor as negotiators, but as facilitators to promote community self-esteem and public sense of power (Lane, 1995).

The main planning problem in Egypt and particularly in historic Cairo is that all government plans present solutions that appear to have been developed in an ad-hoc manner without clear guidelines or understanding of the main causes. There has been a growing gap between the causes of the problems and the superficial solutions that responsible bodies provide (SCA, 2002). These bodies have failed to understand that fast solutions never solve problems; on the contrary, they create more difficulties for the future generations. These intractable problems have led to widespread frustration among the Egyptians as a result of the inability of the consecutive governments to involve the community in shaping the future of their living environments. Furthermore, the Egyptian central government carried all the responsibilities and decisions for providing the basic needs but failed to achieve and modify the existing planning policies (SCA, 2002; UNDP & SCA, 1997).

International planners and organisations, attracted by the aesthetic qualities of historic Cairo's architecture and organic settlement patterns, tend to associate with this fabric an ideal community far removed from the harsh realities of social life in this area (AKTC, 2005b). They are shocked by the lack of appreciation of these inherent qualities, as expressed by residents, local representatives, and local authorities in charge of managing this vulnerable heritage (UNESCO, 2012). In democracies, the resolution of these conflicts is attempted through the process of representative elections and open decision making so that, in theory, all views are taken into account. In many situations the theory can be shown not to work due to abuse (or use) of power (UNDP &

SCA, 1997).

It is not possible to ensure that the policies provided by development experts and decision makers will best cater for the local community's aspirations. Local contribution is necessary to ensure that development projects accurately reflect residents' needs. Besides, engaging the community can help the continuity of the development projects even after funding is discontinued. Moreover, community involvement can build local capacity to address future problems that can be more important than the results of the actual development (Le, 2007; Moon, 2001). As asserted by Pateman, "Participation serves as a part of an educative process through which the individual will eventually come to feel little or no conflict between the demands of the public and private spheres" (Pateman, 1970, p.25).

Involving the community in the proposed intervention can provide a number of key benefits. It can raise the significance of the heritage among the local interest, besides its national importance. Community involvement also diverts public interest from architectural and historical significance into the cultural and societal importance of the heritage. Besides, it promotes a grass roots interest within the community instead of only an elitist concern (Yung & Chan, 2011). Notably, cultural heritage can be approached either as heritage by designation, which follows a top-down strategy with little contribution from the public, or heritage by appropriation, which emerges from public perception rather than imposing experts' decisions (Tweed & Sutherland, 2007).

The research aims to propose viable design guidelines for sustainable urban development in historic Cairo. The study incorporates the relevant literature background and the researcher's observations, along with stakeholders' views and needs in this area, aiming to develop this urban heritage context. Space syntax analysis is applied across various scales and radii measuring the spatial and physical characteristics of the case study. This, in effect, provides an integrated proposition that could potentially resolve part of the problematic case of historic Cairo.

1.1.2 Significance of developing historic Cairo as a cultural heritage site

The UNESCO Recommendations of 1962 stated that safeguarding landscapes, natural environments and those created by man which are of specific cultural or aesthetic importance is essential (Vecco, 2010). The Charter for the Conservation of Historic Towns and Urban Areas (Washington Charter - 1987) has asserted that it is essential to protect historic cities as they embody the values of traditional urban cultures, and play a significant role as historic documentation. This documentation involves both tangible and intangible values that are represented by both physical and spiritual aspects (ICOMOS, 1987). As the World Heritage List extended to include broad and heterogeneous areas in cities, the Organization of World Heritage Cities (OWHC) was founded in 1993, and listed 238 cities that vary in scale and extensiveness (OWHC, 2011). Historic Cairo has been designated a World Heritage Site in 1979.

Heritage is a constituent of the cultural tradition, and an important part of societal and community well-being. Cultural heritage provides people with a sense of identity and continuity, and promotes respect for cultural diversity and human creativity. It is noted that "the preservation of heritage not only contributes to the state of health of the built environment but also crucially to community and cultural identity and helps to define the character of a place" (Tweed & Sutherland, 2007, p.62). In addition, cultural heritage sites are important since intangible cultural heritage is passed down through the generations, and is continuously recreated by communities and groups, in response to their environment, their interaction with nature, and their history.

Heritage protection does not rely only on top-down interventions by government or experts but should also involve local communities. It is essential that the values and practices of communities are fully understood, respected, encouraged, and embedded in the development plans and policy documents, if the interventions need to be sustained in the future. Communities require a sense of ownership for their heritage; this reaffirms their worth as a community, their ways of going about things, their 'culture' (ADB, 1996).

Development of urban heritage sites can thus involve multiple stakeholder

groups with different interests that could and would inevitably conflict. The process of resolving such conflicts has traditionally involved consultation as part of the planning process. However, the consultation process has been mostly criticised for its failure to deal with conflicts of interest and for its lack of transparency. However, failure to adequately take into account the interests of the local community can also cost developers time and money in delays, failed plans, and legal costs. Thus, effective participation in the decision-making process is a vital concern for both groups; developers and decision-makers, and members of the local community.

As a result of globalisation, residents of historic Cairo have started to realise the significance of their influencing voices in shaping their lives and futures (Rashed, 2012b). They have recognised that heritage sites are dedicated to promoting appreciation and knowledge of their history and its importance to understanding the present and anticipating the future (Bell, 2009). Thus, the principles of residents' involvement in decision-making have gradually evolved aiming to achieve and maintain sustainability in the built heritage and guide significant development in the planning and management of those particular contexts.

The current threats to historic Cairo, however, are in many ways not only the negative effect of time but sometimes due to rapid urbanisation, air pollution, unsuccessful intervention, various climatic factors and mass tourism. This rapid development that takes place under the pressure of the remarkable population growth leads to the demolition of not only archaeological evidence but entire historic cultural landscapes. In many countries, such as Egypt, the financial resources are unavailable to lead the development in the direction of cultural continuity (Machat & Petzet, 2010). In addition, the local authorities ignore the need to set any conservation policies or monument protection laws, or to address extant legal regulations. Hence, it is the responsibility of the Egyptian government to safeguard and rehabilitate its heritage sites by encouraging and facilitating sustainable urban development initiatives supported by active involvement of local communities throughout the stages of planning and implementing development schemes.

The following section discusses the significance of the research, how the ideas incorporated in this study have evolved, and the novelty of the research.

1.2 SIGNIFICANCE OF THE RESEARCH

1.2.1 Research motivation

> *For forty kilometers along the valley on either side of the Nile, the history of several thousand years was written in summary form in the space where Arabic Cairo would evolve. From a projection of the Muqattam Hills where Ayyubids built the Citadel (in 1176), one could contemplate this space and, as it were, pass the stages of its history in review: the pyramids rising against the horizon; Old Cairo, visible in the distance; at the foot of the Citadel, the grandiose mass of the Mosque of Sultan Hasan, a Mamluk masterwork and celebrated forerunner of the city of the Thousand and One Nights; and all around, no matter where one looked, the ancient city's landscape of minarets and cupolas being gradually transformed into a modern city, whose boundary at the Nile could only be guessed at in the distance* (Raymond, 2002, p.4).

Although the above description is brief, it provides a holistic visualisation of the unique context of historic Cairo. Since I have enrolled on the undergraduate course of Architectural Engineering at Ain Shams University, I was required to do a lot of research activities within Greater Cairo, and specifically in historic Cairo. We, the students, used to work as teams and spent plenty of time observing, surveying, sketching and proposing design guidelines to develop this rich heritage district, and possibly suggest solutions for its various problems. I used to see our heritage continually falling into serious endangerment, if no creative and holistic initiatives were made; yet I never imagined that I would be so intrigued by and attached to this area, even after graduating. I decided to pursue an academic career and registered and obtained an MSc in Architectural Studies at Cairo University. However, my research scope shifted away from historic Cairo at that stage. Nevertheless, the city's jeopardised beauty and magnificence kept haunting me, and a deep sense of responsibility towards this area kept rising. Thus, I could not resist but take the decision to carry out an in-depth study of historic Cairo's urban problems. I decided to incorporate innovative approaches together with a field survey to produce some viable design guidelines that aspire to solve part of the problems with the least disruption to its context.

So why have I focused on sustainable urban development in historic Cairo? This is because of the poor conditions of historic Cairo and also due to

deficiencies of the urban policies that have often failed to improve and manage this outstanding heritage site. Throughout my preliminary research, I was convinced that a key strategy to fill this gap would be to accommodate the needs of the local residents through a comprehensive intervention in historic Cairo. This intervention is required to mainly fulfil many aspects of sustainable urban development including physical, socio-economic, and environmental sustainability aspects. This has been the starting point for this research.

1.2.2 Novelty of the research

Historic Cairo has attracted numerous rehabilitation, preservation and restoration studies, proposals, and projects, all through governmental, bilateral, and multilateral efforts (UNESCO, 2012). Those endeavours have been limited to the restoration of individual monuments by various foreign missions and the Supreme Council of Antiques (SCA), while more comprehensive attempts at area rehabilitation, both as master plans and action plans, have had little success to date. These studies emerged as an initial effort at conserving the significant historic buildings of historic Cairo in 1882 with the setting up of a Comité de Conservation des Monuments de L' Art Arabe (Sutton & Fahim, 2002). There is no evidence available of significant conservation or development interventions in historic Cairo until the 1980 UNESCO Conservation of the Old City of Cairo (UNESCO, 2012). However, this plan remained a 'paper project' and was not put into action (Sutton & Fahim, 2002). The early 1990s saw three projects which were drawn up by a joint French-Egyptian planning and research body, namely the Institut d'Amènagement Urbain et Regional d'Ille de France and the General Organization for Physical Planning (IAURIF/GOPPP) in Egypt (SCA, 2002). This collaborative research body produced general guidelines for the improvement of the built environment. The most recent plan for historic Cairo was drawn up by a UNDP team which covers an area of about 4 square km in historic Cairo (UNDP& SCA, 1997), followed by the UNESCO Urban Regeneration Project for Historic Cairo (UNESCO, 2012). However, at present, historic Cairo suffers from poor conditions and the outcome of deficient urban policies.

The negative consequences of a conservation policy that failed to see the larger

urban picture were aggravated by planning policies that overlooked the specificities of historic Cairo. In general, over the last decade, planning schemes were developed by government officials poorly acquainted with the characteristics of this unique district and unaware of their value as distinctive urban environments (Sedky, 2009). Fortunately, in recent years, awareness of the value of historic areas has increased. However the gap between intent and existing policies continues to affect the development of historic Cairo. No real attempt has been made to truly understand heritage authenticity or to develop an urban development strategy that is sensitive to this area (Ibrahim & El Rashidi, 2010; El Rashidi, 2007).

In recent years there have been various forms of community-led initiatives in Egypt overseen by the Aga Khan Trust for Culture (AKTC). Those have mainly focused on the social, cultural, and economic revitalisation of communities in the heritage sites. However, there has been minimal involvement of local communities in those initiatives in historic Cairo. Those initiatives have attempted to promote development through the supply of commodities. Instead, they need to support local efforts by encouraging communities to help themselves. Thus, national organisations need to move away from policies that ignore local needs and resources. An active role for local residents should be considered vital in terms of planning, conserving, and developing their local areas. Involving people might well improve their sense of ownership and belonging to their environment, thus securing long-term sustainability.

Research on sustainable development in heritage sites in Egypt is quite limited, although international research and literature on the subject is rich (Al-Hagla, 2010; Nebel & Spiekermann, 2008; UNESCO, 2008; Bianca, 2007; Tweed & Sutherland, 2007; Bianca, 2006; Busquets, 2005; Serageldin, 2004). Most of the literature pinpoints that the concept of sustainability is interpreted depending on its social, economic, political, physical, and environmental unique context (WCED, 2008; Cassar, 2006; Breheny,1992; Rapoport, 1983). Moreover, the conditions for sustainable communities differ among developed and developing countries. However, in Egypt, the common perception of sustainable communities is not well defined. Thus, Egyptian policy-makers

need to have a wider perception of sustainable communities that extends to embrace all the previously mentioned aspects. The current official approach of developing historic Cairo focuses more on the historical monuments rather than on the holistic urban fabric. The perception and attitudes of local people often tend to conflict with this official approach.

Sustainable development has long been known to be based on three pillars of sustainability; social, economic and environmental. However, a fourth pillar of physical sustainability has also been identified to complement the notion of holistic sustainability, particularly in heritage contexts (Tweed & Sutherland, 2007; Cassar, 2006). There exists a considerable gap on development interventions in historic Cairo that consider all pillars of sustainability. The sustainable urban development strategy that the research proposes builds on the challenges and opportunities derived from previous studies and development projects in historic Cairo (AKTC, 2005b; SCA, 2002; UNDP & SCA, 1997; UNESCO, 1980) where it aims to resolve some of the major problems in this heritage site.

1.3 RESEARCH AIM, OBJECTIVES AND QUESTIONS

The research aims to fill the gap by proposing an evidence-based set of viable design guidelines that aim to achieve sustainable urban development - socially, economically, environmentally, and physically - in historic Cairo. The study merges the views, perceptions, and aspirations of the local community to underpin the crucial problems in this historic centre that require specific design guidelines to alleviate them.

The research aim subdivides into several objectives. Firstly, it reviews the key tools for promoting sustainable urban development, particularly in heritage sites. Secondly, the research examines historic Cairo's potentialities and constraints that may facilitate or impede sustainable urban development. Furthermore, the study attempts to pinpoint means of achieving sustainability in this heritage site. It further investigates how the Egyptian government perceives involving residents in the planning process, and the viability of engaging stakeholders in development interventions in historic Cairo. Finally, the research highlights the fundamental propositions that are required for

potentially successful interventions within this particular urban and social context.

Research questions

- Why is historic Cairo in need of sustainable urban development?
- What are the current urban development constraints that prevent historic Cairo from achieving sustainability?
- How can historic Cairo achieve sustainable urban development? What are the fundamental design guidelines required for viable interventions?
- What is the government's attitude towards involving residents in the planning process?
- How is it possible for community stakeholder groups to ensure that their views are taken into account by decision makers?

1.4 RESEARCH METHODOLOGY

By analysing the opportunities and constraints of involving community stakeholders, this research focuses on sustainable urban development in historic Cairo. It identifies the radical changes needed among urban planning authorities to initiate feasible action to address the dangers of rapid urban growth in heritage sites. It has been widely acknowledged that decision-making has become too centralised and that there is a failure to respond to the needs and expectations of local communities. The research proposes critical prerequisites and a viable framework for achieving sustainable urban development within the urban context of historic Cairo, supported by the participation of stakeholders.

To ensure systematic analysis of the key aim and detailed objectives, a mixed method research design is adopted. The study is driven by a pragmatist approach and uses qualitative and quantitative data collection and analysis methods focusing on the case of historic Cairo. This world heritage site is investigated based on archival documents of its historical development, quantitative and qualitative research tools, and space syntax techniques. The adopted methodology seeks to examine aspirations of stakeholder groups in historic Cairo and applies space syntax techniques as a novel tool to develop appropriate interventions for sustainable urban development. It incorporates

GIS building survey results to provide syntactic layers for the proposed spatial intervention.

Extensive observations and in-depth interviews with professionals, experts, and academics have been carried out. In addition, a questionnaire has engaged a sample of 180 participants from diverse stakeholder groups in historic Cairo. The rationale for this is to try and marry bottom-up perceptions with top-down decisions, thus developing an appropriate intervention that combines both. Statistical tools and observations are combined with space syntax analysis, examining measures such as integration, choice, and connectivity. This helps understand the influence of spatial configuration on social activity in historic Cairo. Hence, tailoring a set of design guidelines that fit with the area's existing socio-economic, urban, environmental, and heritage contexts is crucial.

1.5 THESIS STRUCTURE

Following this introductory chapter, **Chapter two** provides a thorough understanding of the existing research of sustainable urban development in heritage sites. This is achieved through bringing in a review of acknowledged precedents of development interventions comparable to the present study. **Chapter three** examines research methodologies related to the study. Approaches that could be useful in developing the appropriate tools for this research are explored. It is here that the research questions that are used in developing the research instruments are refined. Methods adopted for collecting, organising, managing, and analysing data are explained. Hence, the research design model is developed, the rationale of its framework is explained, and the limitations of the study highlighted.

In **Chapter four** the case study of historic Cairo is presented by outlining the historical development of its urban and social fabrics, and reasons for the ongoing decline. Sustainable urban development propositions are suggested and discussed, and previous development interventions in historic Cairo are reviewed. **Chapter five** explains the field work survey, including the questionnaire and interviews. The survey aims to understand historic Cairo from the perceptions, values, behaviour, and attitudes of its stakeholders. It also evaluates the current circumstances of the social and urban contexts of

historic Cairo to help facilitate a successful intervention in this historical area. It is in this chapter that how the data are processed and synthesised into new analysis constructs is described.

This is followed by **Chapter six** which introduces space syntax analysis techniques in the case of historic Cairo. This analysis helps explore the historical spatial transformation of the case study since its evolution until the present. The aim of this is to propose a comprehensive methodology to develop appropriately tailored spatial interventions. Finally, an integrated proposition that aims to resolve some of the major problems in historic Cairo is produced. Lastly, **Chapter seven** comprises the discussion and conclusion of the design guidelines drawn up for a sustainable urban development in historic Cairo. The chapter attempts to respond to the research questions posed and projects potential domains for future research.

CHAPTER TWO

A REVIEW OF PRECEDENTS OF SUSTAINABLE URBAN DEVELOPMENT IN HERITAGE SITES

Chapter Contents

INTRODUCTION

International concern and commitment to preserve and support heritage sites has increased significantly in the past few decades due to the many challenges that public authorities, NGOs and local communities face in trying to preserve their historic contexts. The challenges grow with attempts to preserve the built environment whilst maintaining, if not enhancing, communities' socio-economic welfare, and livelihood. Thus, some recent preservation initiatives and interventions have aimed to provide comprehensive approaches to development that focus on improving the living conditions of local communities within heritage sites and sustaining economic viability, such as the cases of the Old City of Aleppo, the Historical Area of Jeddah, and the Al-Darb Al-Ahmar Revitalisation Project in historic Cairo.

Hence, considerable global and regional efforts in sustainable development of heritage sites have been acknowledged for this study (Karimi & Parham, 2010; Jeddah Muncipality, 2009; UNESCO, 2009; Hillier et al., 2008; Nebel & Spiekermann, 2008; UN-HABITAT, 2008; UNESCO, 2008; AKTC, 2005b; Busquets, 2005; SCA, 2002; UNDP& SCA, 1997; Al-Asad, 1995; UNESCO, 1980); a few of which are discussed. This chapter provides a review of relevant rehabilitation projects in heritage sites in Aleppo - Syria, Jeddah - Saudi Arabia, and historic Cairo - Egypt.

These case studies represent a selection of initiatives in the enhancement and conservation of cultural heritage and the rationale for selecting those initiatives owes to their potential sustainability and positive outcomes (UNESCO, 2009; UN-HABITAT, 2008). The projects have influenced the approach adopted in the present study; thus lessons learnt from these case studies have been extracted and discussed. It should be noted that the case of Aleppo has been studied based on the outcomes of the rehabilitation intervention before the current political turmoil that had destructive impact on this heritage site.

2.1 SUSTAINABLE URBAN DEVELOPMENT IN HERITAGE SITES

The World Commission on Environment and Development (WCED) states that sustainable development "must meet the needs of the present without

compromising the ability of future generations to meet their own needs" (WCED, 2004, p.54). Sustainable development is not a fixed state of harmony, but rather a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development, and institutional change are undertaken consistent with future as well as present needs (WCED, 1987). The Organisation for Economic Cooperation and Development (OECD) identifies sustainable development as a case where "human wellbeing includes not only the satisfaction of economic needs, but also aspirations for a clean and healthy environment, and preferences in terms of social development. Types of capital that sustain wellbeing include natural, human, and social capital" (Waller-Hunter & Jones, 2002, p.53). Furthermore, sustainable development has been defined as "the broad view of human welfare, a long term perspective about the consequences of today's activities, and the full involvement of civil society to reach viable solutions" (OECD, 2001, p.5).

Notably, sustainable urban development has been described as a process of "synergetic integration and co-evolution among the great subsystems making up a city (economic, social, physical and environmental), which guarantees the local population a non-decreasing level of wellbeing in the long term, without compromising the possibilities of development of surrounding areas" (Camagni, 1998, p.6). Sustainable urban development is ultimately a cultural statement about people, how they want to live, and their ability to manage needs, desires, and aspirations (Williams, 2000, p.6). These are all desirable and essential components of sustainable urban development, which were fully practiced internationally and helped to promote social, economic, and environmental growth.

Sustainable urban development is required in conservation and rehabilitation interventions in historical areas to ensure sustainable outcomes in preserving an area's cultural and historic identity. The importance of sustainable conservation not only includes the physical state of the built environment but extends to the importance of community and cultural identity (Tweed & Sutherland, 2007). Conservation initiatives and their associated interventions need to respect the

existing urban fabric in heritage sites, including its uses, associations, and meanings, with no emphasis on one value at the expense of others. Through careful physical intervention that refrains from distorting historic evidence within the layers of the urban fabric, authenticity of tangible and intangible values would be preserved (ICOMOS, 1999a).

Whilst however remaining faithful to basic cultural and morphological principles, physical conservation needs to respond to contemporary needs and the living conditions of residents must be improved in order to revitalize the community from within and to enable residents to take charge of their built environment (Bianca, 2007). Whenever physical interventions are carried out without relating them to socio-economic action, their effects rapidly disappear and even the best-intentioned conservation projects may prove unsuccessful exercises and a waste of funds (Sutton & Fahim, 2002). Another issue in conservation practices is the often experienced contradiction and tension between professional approaches and philosophies that change over time with consecutive initiatives. This is further elucidated by Larkham (1996) "as the time-span of any one such dominant paradigm overlaps the decline of its predecessor and the rise of its successor, there are clear conflicts of ideology in the design and production of the built environment" (Larkham, 1996, p.18).

Conservation and rehabilitation are therefore required to enable the community to play an active role in development, as they deal directly with community assets and its physical wellbeing (Al-Hagla, 2010). This mutual relationship between physical and social objectives will encourage residents to identify with the built environment and will help in breaking and reversing the downward spiral of decline to which historic Cairo has been subject in the past, and which continues to the present day. Hence, sustainable urban development requires mobilising governments, the private sector, and the general public towards broad action strategies that need to be targeted in order to achieve short- and long-term sustainable quality of life and environmental eminence.

The following sections investigate several rehabilitation projects that have been acknowledged for their sustainable urban development outcomes. The projects selected for this review demonstrate a variety of methodologies adopted for

different historical districts each characterised by particular urban, political, and socio-economic contexts. These rehabilitation initiatives have been scrutinised to help inform the approach adopted in the present study.

2.2 THE REHABILITATION OF THE OLD CITY ALEPPO (ReHalab)

Aleppo (Halab) is the largest city in Syria located in the north-west of Syria and serves as the capital of Aleppo Governorate. The Old City of Aleppo was designated a World Heritage Site of international recognition in 1986 (Bianca, 2010; Herrle et al., 2005). The Old City is one of the oldest surviving settlements in the world with one of the most outstanding urban monuments of the Islamic domain: Aleppo Citadel (Busquets, 2005; Bianca, 2000). Different successive cultures in Aleppo - Greek, Romans, Persians, Arabs, Mamluks and Ottomans, among others - resulted in its current form of multiple historical layers. This is evident from its aerial view and by walking along its streets and into the buildings and courtyards to experience the simultaneous existence of the historical layers (Nebel & Spiekermann, 2008; Herrle et al., 2005). Another major element that made Aleppo a unique site was its geographic location between East and West where the city was used as a stopover on traverse itineraries, crusades, and invasions. Thus, the city of Aleppo achieved exquisite richness resulting in the worldwide interest and extensive observations and documentation by varied cultures and perspectives (Bianca, 2000).

The Old City's 355 hectares (3.5 square km) of traditional urban fabric is home to around 110,000 residents, and supports 35,000 daily jobs; constituting the legacy of this continuously inhabited city (OWHC, 2007). The Old City of Aleppo consists socially and spatially well-defined neighbourhoods with strong economic, social, and functional linkages to the Aleppo Metropolitan area. The Old City contributes in the local economy of Greater Aleppo where the central market (Al-Madina Souq) is an important commercial focal point that attracts the rural population from around Aleppo, as illustrated in figure 2.1 (Nebel & Spiekermann, 2008; Herrle et al., 2005) and the khans still function as wholesale centres for national and international trade of traditional goods (OWHC, 2007). The whole complex (souq, mosque and the Citadel of Aleppo) of historic architecture and traditional patterns of use not only attracts tourists

from Syria and other Arab countries, but also from Europe and the rest of the world (Busquets, 2005; Bianca, 2000).

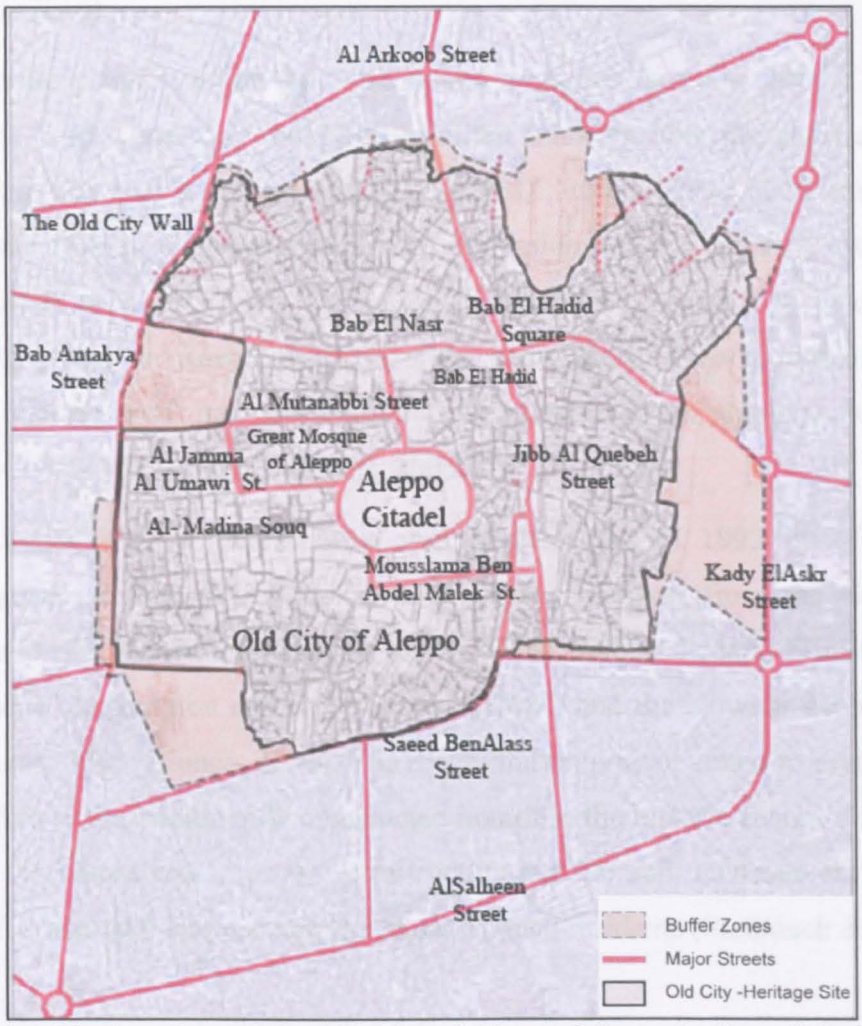


Figure 2.1 The boundary of the Old City of Aleppo follows the line of the historic walls of the old city. The Citadel and Mosque complex are central to the city (Source: Herrle et al., 2005, p.23)

However, the Old City of Aleppo faced a decline in its physical and economic conditions during the second half of the twentieth century (OWHC, 2007) accompanied with inappropriate foreign models applied without considering the richness of the context. The Old City had been suffering decaying infrastructure, run-down urban fabric with structurally unstable structures, a congested network of road traffic and lack of public and green spaces (Sarkis, 2005; Vincent & Sergie, 2005). Moreover, as in many historic cities in the Arab countries, the urban fabric of the Old City of Aleppo is dense, with narrow corridors and alleys permitting limited access to vehicular traffic (Spiekermann, 2010; Vincent & Sergie, 2005). Thus, conserving and restoring

the physical urban environment in the Old City would have an effective positive impact in all aspects for local communities and developers (Stellmach & Saad, 2010).

The earlier plans in urban planning, social migration, and the shift of usage patterns in the inner city areas had left their mark on both the physical and social environment and habitat of the city (GIZ, 2008). These plans aimed to segregate diverse elements, reduce the dimensions of the old city, establish new multi-story buildings, and provide better accessibility by widening existing streets to connect different areas. Fortunately, these proposed plans were rejected and new rehabilitation approaches were implemented by UNESCO (OWHC, 2007; Busquets, 2005).

The UNESCO rehabilitation plan was implemented in 1992 by efficient management teams with technical and financial support from the German International Cooperation (GIZ) on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ) and the Kuwaiti Arab Fund (Busquets, 2005; Bianca, 2000). The rehabilitation project aimed to revive the urban life in the traditionally constructed homes in the historic central districts, re-use the vacant areas, restore infrastructure and the built environment of the Old City, and take into account the needs of local residents (Stellmach & Saad, 2010).

2.2.1 Physical development and spatial intervention

Physical conservation and development contributed significantly to the image of the Old City of Aleppo; thus it improved living conditions and the economic environment, strengthened residents' sense of place, and raised awareness of the cultural value of the Old City (Nebel & Spiekermann, 2008). Physical conservation and development in the Old City of Aleppo comprised the adaptive re-use of historic buildings and mosques, upgrade and maintenance of infrastructure, and conservation and development of public open space (Stellmach & Saad, 2010; Nebel & Spiekermann, 2008; Herrle et al., 2005). This physical upgrading, restoration, and renovation of monuments and significant buildings played an important role in creating and dispersing a

positive attitude among local citizens of the Old City towards the rehabilitation process. This, in turn, encouraged both private and public investments in Aleppo (Spiekermann, 2010; Vincent & Sergie, 2005).

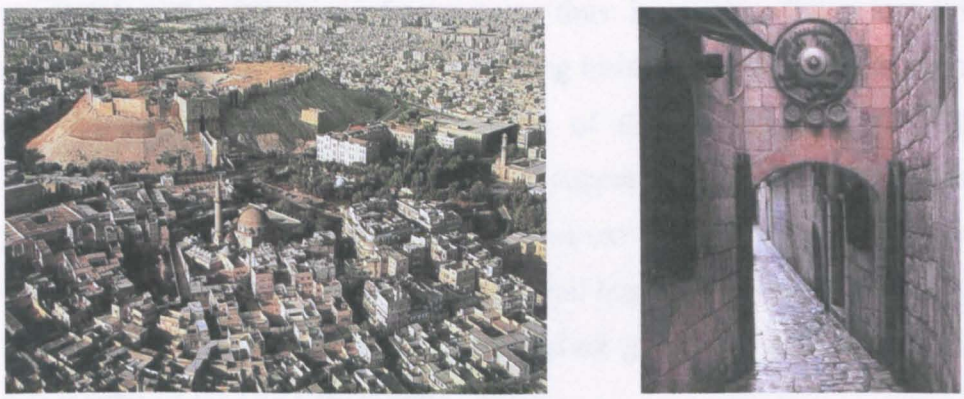


Figure 2.2 (Left) An aerial view of The Citadel of Aleppo, the Ayyubid Palace complex, and the organic street networks, (Right) A winding narrow street in its original rendering; one of the main features of the traditional urban fabric of the Old City Aleppo, many of which are still in use and in good condition (Source: Nebel & Spiekermann, 2008).

Historic monuments and significant buildings are expensive to maintain and rehabilitate, and always face many challenges to adapt to modern uses. The success of the development project lay in allocating a minimum usage of public resources and effectively involving residents and commercial users. In addition, the restoration of infrastructure and built environment was implemented carefully so as not to affect the historic image of the Old City and maintain the ancient organic street networks and cul-de-sacs (figure 2.2).

The adaptive re-use strategy in the Old City of Aleppo was to protect historical monuments from abandonment and demolition, reduce vacant space in old cities by introducing missing functions, preserving architectural and cultural values, and revitalising old city areas by adaptive re-use that responded to modern needs of the inhabitants. The significance of adaptive re-use of monuments and historical buildings was considered an effective strategy towards conservation of cultural heritage by launching new functions, particularly with vacant monuments. In addition, the strategy created new opportunities for private businesses and public revenue (Bitar, 2006).

According to Syrian building regulations in heritage sites, a comprehensive programme for conservation of residential units was introduced to preserve the

residential character of the Old City. The programme has succeeded in upgrading the residential buildings to modern standards of functionality, and maintaining the existing infrastructure, thus improving living conditions, creating an attractive environment for living inside traditional neighbourhoods, and improving the public's perceptions of the Old City (Chibli, 2004). Residential buildings were refurbished by supporting residents with a financial programme to ensure continuous improvement of the building fabric of the existing houses. Many public spaces of civic importance have been renovated, thus providing more accessibility, and adding greater value to this culturally rich quarter of the Old City (Sarkis, 2005).

This approach helped safeguard residential buildings and monuments from further deterioration and loss due to structural damage caused by water leakage and rising ground-water levels. It helped provide regular access to clean potable water and improved public service facilities to the historic city. In addition, the strategy of traffic management reduced overall transit traffic throughout the historic centre, created areas for pedestrians in significant areas, improved access for residents and business activities, improved public transport services, and provided parking areas outside the historic centre (Nebel & Spiekermann, 2008).

Furthermore, the upgrading approach of public open space improved the sense of place and authenticity among residents and visitors of the Old City. This was done by redesigning the public open areas for social communication and developing coherent recreational zones in the dense urban fabric of the traditional residential quarters (Spiekermann, 2010; Stellmach & Saad, 2010; Nebel & Spiekermann, 2008; Herrle et al., 2005). In addition, the existing historic street network was used for short pedestrian connections and tourist trails. The public investment in upgrading the public open spaces had a knock-over effect and stimulated private shareholders to invest in the building stock (Stellmach & Saad, 2010; Herrle et al., 2005).

Through the process of rehabilitating the Old City of Aleppo, tools and methods to appropriately reveal the multiple layers and develop new design strategies that bond with earlier strategies have been carefully considered

(Busquets, 2005). The major challenge facing this development project was posed by the improvement of the socio-economic conditions of the local residents and users, while preserving the historic integrity of the urban fabric (Spiekermann, 2010; GIZ, 2005; Vincent & Sergie, 2005; Bianca, 2000).

2.2.2 Local economic development

Heritage sites cannot be preserved without taking into consideration the economic development of the area. A key problem in heritage sites is that most of the benefits of economic growth are usually directed towards tourism facilities and hotels whilst local members, who are required to maintain their building themselves, gain little from development initiatives (Nebel & Spiekermann, 2008). In the Old City of Aleppo, the lack of nearby parking and the difficult access to shops were the most common complaints among the shop owners. These problems made it difficult to load and unload goods, and the day-to-day running of business became a burden to existing and potential shop owners (Nebel & Spiekermann, 2008). Besides, many activities in the Old City of Aleppo lost their competitiveness due to the economic and political reform strategy implemented by the Syrian Government that encouraged the free market rather than state-driven economy. As a result of this, many small traditional activities disappeared (von Rabenau, 2003).

The local development goals in the Old City of Aleppo have succeeded in improving the local business climate through regulatory reform, better investment condition, and private-public dialogue. This strategy assisted in the transition of the local economy to be consistent with preservation needs and broadening development tools. This included incentive and subsidy schemes, development projects related to workforce training, business retention, and external investment (Nebel & Spiekermann, 2008; von Rabenau, 2003). The implementation of this strategy focused on developing new management organisations for historical districts, and increased business participation in strategy development and implementation through greater capacity of business chambers and trade associations, and mechanisms for public-private consultations (Nebel & Spiekermann, 2008; von Rabenau, 2003). UNESCO (2008) suggested that in the Old City of Aleppo, economic policies should

encourage development and income growth which should be consistent with historic preservation goals (Nebel & Spiekermann, 2008).

2.2.3 Community development

Negative public perception or lack of awareness about potentialities and significance of historic cities often prevail before they eventually converge into a rehabilitation project (Nebel & Spiekermann, 2008). It is asserted that a comprehensive rehabilitation approach is a civic task that should involve the collaboration of the public and private sectors, NGOs, and local residents (Khechen, 2005). Different interests should be negotiated as early as possible during the preliminary stage. The rehabilitation strategy in the Old City of Aleppo has succeeded in encouraging public-private partnership, not as a means to supplement the government resources but as an obligation on the part of all citizens and improving the social services.

With regard to urban rehabilitation of the Old City of Aleppo, improvement of social services responded to the demands of the community members of the Old City, in particular those of women. It also created an attractive living environment for inhabitants to remain in the old cities rather than moving to other areas outside the Old City (Abdul Wahab, 2005). There was a lack of true community participation in the preliminary stages of the project where, in most cases, the residents' aspirations and needs could not be reflected. Representatives were mostly selected by local authorities and the majority of them did not live in the area they represented (Nebel & Spiekermann, 2008).

The German International Cooperation (GIZ) overcame this problem, however, in the following stages after implementing participatory surveys. The surveys provided trust between planners and residents as the interests of residents were of concern, a subject that had long since been neglected (Khechen, 2005). Local communities in the Old City of Aleppo were usually informed in advance regarding any future plans and implementation steps during the conceptual phase. With the support of the Directorate of the Old City (DOC), GIZ organised regular public meetings for discussions, recommendations, and intentions to participate. The DOC and GIZ also staged a variety of events and

campaigns addressing different target groups to raise awareness of the cultural significance of the Old City of Aleppo (Sarkis, 2005). The campaigns focused on specific problems; for instance, to reduce the noise - particularly in residential areas, importance of the cleanliness in the neighbourhoods and market places, the environmental significance of green spaces, and the execution of new traffic regulations and infrastructure (Nebel & Spiekermann, 2008). The campaigns established and maintained an encouraging and stable environment in which private developers, local residents, and NGOs could take investment risks, which in turn provide a more equitable distribution of benefits in local partnership activities (Khechen, 2005).

2.2.4 Pollution reduction and environmental management

As is the case with most over-populated districts, traffic congestion, and pollution are a major problem in the Old City of Aleppo. Pollution from industrial activities, traffic, and household waste is significantly high in the Old City of Aleppo. The historic centre of the Old City has always been more vulnerable to these problems than other areas in Aleppo due to its central location and the prevailing threats and challenges (Chibli, 1998). The image of the Old City was degraded by the neighbourhoods which were mostly contaminated due to the lack of solid waste collection management (Nebel & Spiekermann, 2008). An air pollution assessment was undertaken which revealed there was a high particulate pollution emerging from transportation in the area. It was mainly traffic that caused the increase of air pollution and affected the historical monuments. The Old City as a commercial and administrative centre was suffering high levels of noise in the major traffic axes which became an increasing source of discomfort to people living in the area (Chibli, 2002).

Since the Rehabilitation of Aleppo project was launched, the DOC with the support of GIZ recognised that successful collection of solid waste and sanitation could not be achieved without the involvement of and support from local communities. They introduced regular supervision from the local community and imposed fines on residents and shop owners who did not abide with waste collection regulations (Nebel & Spiekermann, 2008).

An appropriate concept for supporting the Municipality was established to monitor the existing traffic network situation and develop plans for the expected future traffic patterns. The strategy for traffic was developed in Old Aleppo to reduce the heavy traffic in the most heavily congested areas, and to provide the best accessibility to businesses inside the Old City (Stellmach & Saad, 2010; Nebel & Spiekermann, 2008; Herrle et al., 2005; Chibli, 2002). The passage of small trucks, tricycles, and vehicles through the historic core was cut by physical measures (for example: steps built into the street). With the support of the Ministry of Transport, DOC transformed several streets to one-way traffic and introduced pedestrian zones (in front of the great mosque) (Chibli et al., 2000). Vehicles and small trucks were regulated during daytime (no entrance allowed between 11.00 am and 16.00 pm) to reduce the congestion in the historic core (Jansen & Tabor, 2002). Parking facilities were distributed around the central part of the Old City and additional bus lines were introduced to serve the Old City and reduce the use of private vehicles in the area (Planco Consulting GmbH, 2003).

The Syrian Government relocated several industrial areas that caused noise pollution outside the Old City of Aleppo in an industrial new town. These decisions had both positive and negative impacts; on the positive side their relocation would remove the source of noise and air pollution and improve the image of the Old City of Aleppo (Herrle et al., 2005). On the negative side, it led to the significant reduction in sources of work, and an increase in the rates of unemployment between the community members. In addition the development strategy implemented relocated government offices to areas outside the Old City of Aleppo. The relocation of these buildings helped provide alternative locations for new tourism investments in close proximity to the Citadel, besides dispersing the heavy traffic from within this area.

The Rehabilitation of the Old City of Aleppo project had many positive impacts on Aleppo Metropolitan in terms of developing the urban fabric, socio-economic development, and environmental management. However, further conservation, restoration, repair, and maintenance of the building fabric would have been required through holistic conservation management plans. It is worth

noting, though, that after the recent and ongoing political turmoil in Syria, all development projects have been terminated where several heritage sites have been destroyed.

2.3 THE HISTORICAL AREA OF JEDDAH

The historical area of Jeddah, known as Al Balad, is one of the most important areas in the city of Jeddah due to its authenticity and its significant monuments and residential buildings. Jeddah is the main route for air access and the harbour gate that receives pilgrims heading to Makkah (SCTA, 2006). The historical area of Jeddah goes back to the era before Islam and represents the heart of Jeddah, with distinguished architecture and unique urban fabric in the Arabian Peninsula (Jeddah Muncipality , 2009). The historic Jeddah includes many historical monuments and heritage buildings such as the Old Jeddah wall and gates and its historical courtyards. There are also a number of historical mosques, old markets (souqs) and a large number of outstanding residential buildings (Jeddah Muncipality , 2009). The historical area of Jeddah is also known for its narrow streets and alleys, and traditional and urban fabric, along with the heritage buildings that are still in use and remain in good condition (SCTA, 2006). Inherited from the Islamic civilisation, these structures reflect the Andalusian, Ottoman and Arabesque art of their eras in architectural forms and decorative ornaments in mosques and residential buildings (Jeddah Muncipality, 2009; SCTA, 2006).

The historic area of Jeddah expanded rapidly over the last two decades driven by two competing forces; radial growth around the historic core and linear growth along the Makkah and Madinah Roads (Hillier et al., 2008; Karimi & Parham, 2008). The area has undergone massive growth due to overpopulation which led to gradual decline. The condition of the area has progressed to become a combination of physical and social problems that worsened as the city continued to grow. The unplanned areas around the historic area of Jeddah have the highest residential densities in Jeddah, with nearly 500 people per hectare (Hillier et al., 2008), whereas the average density in the built-up area in Jeddah is 150-300 people per hectare (Abdulaal, 2012). These unplanned areas lacked connections between their urban layouts and the surrounding urban

route structure which restrained potential investment in the area, increased social segregation, and intensified the problem of overcrowding. Thus, in 2005, Jeddah Municipality in collaboration with Space Syntax Limited created a spatial development strategy for the historic core and unplanned settlements to help support the application for Historic Jeddah to become one of the listed World Heritage Sites in UNESCO (Karimi & Parham, 2010; Hillier et al., 2008).

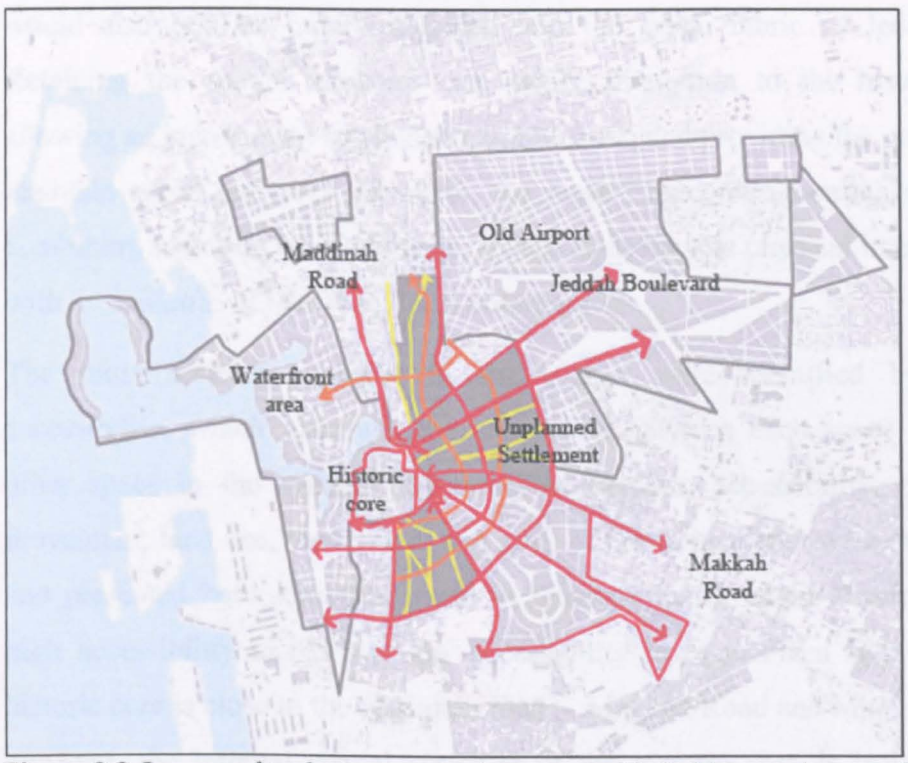


Figure 2.3 Improve local structure to integrate with Jeddah road network (Source: Karimi & Parham, 2010)

The Development Framework aimed to create a socially, environmentally and economically sustainable development strategy whilst appreciating the urban heritage of the historic core. The objectives of the framework were twofold; first, to protect the Islamic heritage by protecting and managing Jeddah's cultural heritage; and second, to preserve the historic core with an appropriate spatial intervention that maintained its original value and authenticity. The spatial intervention is the focus of the review of this case study as it provides lessons for the proposed sustainable urban development strategy in the present study.

2.3.1 Preserving the historic core: The spatial intervention

The problems of the historic core in Jeddah were to be addressed where the original nature of the spaces needed to be retained where possible (Hillier et al., 2008). The proposed intervention illustrated that with careful planning of the wider area of Jeddah, combined with the transformation of the historic core, the whole spatial structure of the city would be connected and drawn towards the historic centre. In addition, the historic core and unplanned settlements would also become more integrated into the urban fabric of Jeddah city. Retaining the spatial structure can reduce disruption to the historic core allowing an incremental implementation process, and providing the potential to maintain social networks. However, the project outcomes focused mainly on combining scientific measurements, spatial analysis, and physical interventions with no evidence of involving local communities.

The most accessible spaces in the system were identified by spatial accessibility, which measures the correlation between each space with any other space in the system. Relationships between accessibility, pedestrian movement, land use, land value, and rates of crime incidents were then tested and presented both statistically and as thematic maps, where results showed high accessibility in red and low accessibility in blue. From figure 2.4 the historic core is close to the two main roads - Makkah Road and Madinah Road; however, the internal spatial structure of the historic core is isolated from surrounding areas in Jeddah. This was realised from the massive concentration of green and blue lines, which represented the segregated nature of the historic centre. The inner routes were more difficult to reach, less likely to be passed through, and less integrated than the outer roads (represented in red tones).

Figure 2.4 Global accessibility analysis (Rn) shows the current spatial isolation of the Jeddah historic core (Source: Hillier et al., 2008)

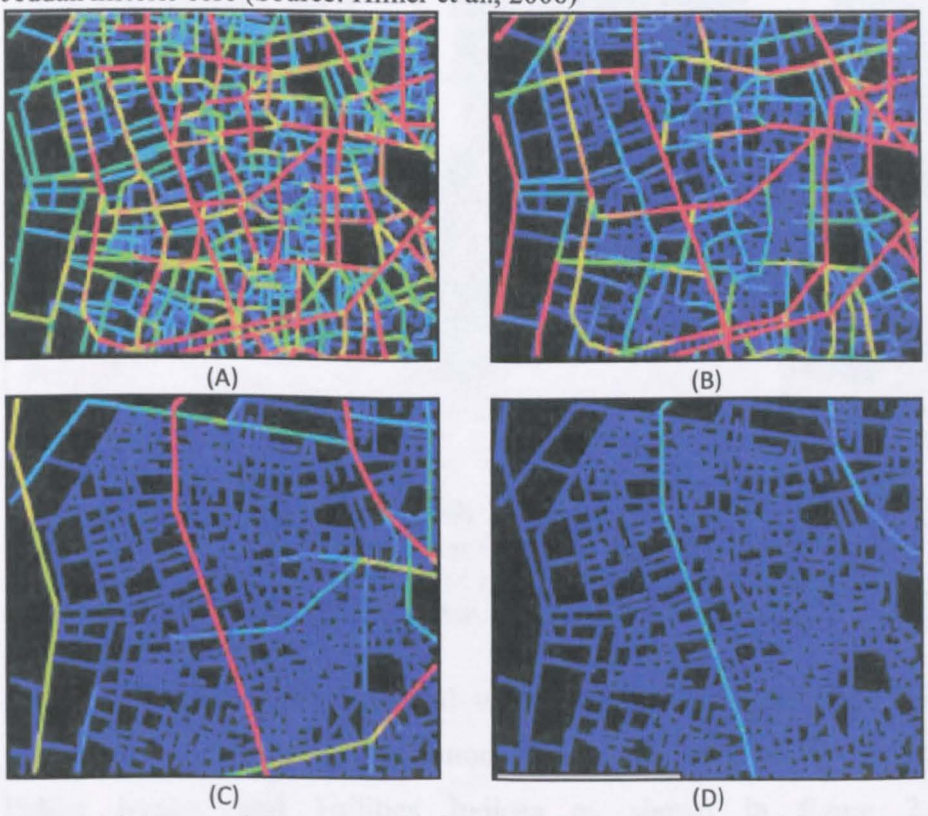


Figure 2.5 The spatial structure of the historic core changes with increasing radius (A) Local accessibility analysis (R400 metres) shows a pattern of centres and sub-centres in red and orange color, (B) Local accessibility analysis (R 2000 metres) shows the centre only, (c) Global accessibility analysis the north south links appear whilst the east-west fade, (D) Global accessibility analysis (Rn) for the whole city of Jeddah shows the fading north-south line (blue color) (Source: Hillier et al., 2008; Karimi & Parham, 2008)

From figure 2.5 the problems of the historic core were recognised as global accessibility, as the old centre had a well-connected local structure but was disconnected globally and considerably segregated from Jeddah city. The

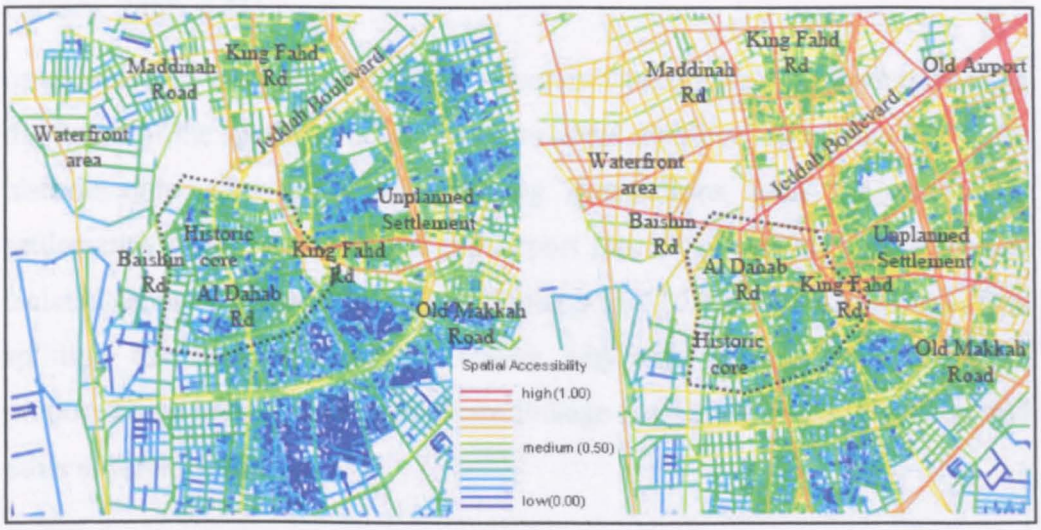
spatial structure was required to reconnect the old core at the city-wide scale (global scale). Jeddah Municipality and Jeddah Development and Urban Regeneration Company (JDURC) approved a key planning strategy to merge the unplanned settlements, waterfront areas, and old airport site around the historic core with the urban and social structure of Jeddah city (figure 2.3). Space syntax technique was used in an attempt to reintegrate unplanned settlements while preserving the existing local structures in each settlement. The connections of the local structures to the larger-scale network links were also improved.

(A) (B) (C)

Figure 2.6 Transformability (A), Public Realm(B), and Utilities (C) Indices where the highest score represents the minimum level of intervention required and the lowest score stands for the maximum level of intervention needed. These indices provide an overview of each settlement rather than a breakdown of each plot. (Source: Karimi & Parham, 2008, pp.26-28)

Moreover, Space Syntax Limited with the support of Jeddah Municipality combined the spatial model with non-spatial factors such as Transformability, Public Realm, and Utilities Indices as shown in figure 2.6. The Transformability Index refers to building conditions, building heights, age of the buildings, materials, occupation and land use (Karimi et al., 2007, p.034:08) and applies different formulae according to each unique case. The map of the Transformability Index analysis illustrates buildings with less transformability in blue tones, whilst those of more transformability are illustrated in red tones (as in figure 2.6 A).

The Public Realm index refers to the provision for and the existing status of, the public space, reflecting the "combined score for the quality of the public realm based on the provision of surfaced roads, pavement, street lighting, and green/open space" (Karimi & Parham, 2010, p.27). According to the Public Realm Index, the majority of plots are in need of the maximum level of intervention, particularly the more segregated plots as shown in the lower values in figure 2.6 (B). The Utilities Index, on the other hand, refers to the availability of infrastructure and services in the historic core and the plots' access to water, sewage, and electricity. Most of the plots in these settlements have access to infrastructure and services (figure 2.6 C).



(A) Old situation (B) New plan

Figure 2.7 The global accessibility choice of the historic core of Jeddah, (A) the old situation of the spatial accessibility (B) the planned spatial accessibility of the historic core (Source: Hillier et al., 2008)

By building these non-spatial indices on the space syntax model, all these factors could be integrated into a comprehensive spatial intervention strategy as illustrated in figure 2.7 (B). In many cases, changing the local structure by removing unregistered buildings in the historic core could affect the lives of the local residents and might influence the future of the city in a negative way. Thus, any decision concerning future spatial interventions should take into account the existing status of the buildings, besides holding consultations with the local residents. The new space syntax model highlighted the integration of the historic core with Jeddah city, as shown in figure 2.7(B).

The spatial accessibility analysis at the scale R5000 metres of the old situation is shown in figure 2.7 (A) and the new plan is illustrated in figure 2.7 (B). The old situation of the historic core was isolated from Jeddah city whilst the new plan for spatial intervention in the historic core emphasised - in the space syntax model - the radial boulevards (Jeddah Boulevard, King Fahd Road, and Baishim road) as the most accessible routes with the Madinah and Old Makkah Roads. The boundaries of the historic core were improved with increased lateral movement between the residential settlements. The formation of these radial boulevards would alleviate pressure on the existing routes of Makkah and Madinah Roads and integrate the historic core with Jeddah city (Karimi & Parham, 2010, p.41).

In addition, the new plan for spatial structure would have a positive impact on the future of the spatial structure and functional distributions of land use in the historic core after establishing strong connections with the unplanned settlements, waterfront area, and old airport site. However this caused several isolated areas in the historic core particularly in Al Dahab road to evolve, thus splitting the historic core, the reason why the development framework proposed a pedestrian bridge to create linkage between the historic centre and other adjacent areas.

2.4 URBAN CONSERVATION PROJECTS IN HISTORIC CAIRO

Historic Cairo, the in-depth case study of the present research, is acknowledged worldwide as one of the most authentic and outstanding examples of the extraordinary Islamic monuments, and one of the World Heritage Sites. It represents a witness to the international importance of Cairo during the medieval period. Boundaries of historic Cairo were defined by Historic Cairo Centre and SCA, to extend from Bab al-Futuh and Bab al-Nasr in the north to Ibn-Tulun Mosque in the south, and from the Ayyubid Historic Wall in the east to Port-Said Street in the west; stretching across 3.22 square km (SCA, 2002; Antoniou, 1999). Most of the historic fabric and architectural heritage is still in use and in relatively fair condition, particularly when compared to other World Heritage sites of the Arab World.

During the late nineteenth century, historic Cairo has been the inspiration of many studies and projects by national and international organisations, testifying to its outstanding heritage, and pointing out the threats from the urbanisation and rapid modernisation. All these initiatives, scattered across the urban fabric of historic Cairo, have to some extent helped to increase awareness of the need for preserving historic Cairo (UNESCO, 2012; Fahmi & Sutton, 2003; Ouf, 2002). However, these initiatives were not sufficient to protect the whole of the historic fabric and its architectural features, and often reflected different and contradictory concepts of conservation.

Consequently, after the 1992 earthquake in Cairo, an International Symposium on the Conservation and Restoration of Islamic Cairo was organised in Cairo by the Ministry of Culture (MoC), in collaboration with the World Heritage Convention (WHC) (UNESCO, 2012) to raise awareness among local authorities of the need to alter the conservation strategies in historic Cairo and adopt new approaches to consider and involve local residents in the conservation process (UNDP & SCA, 1997). In addition, the symposium outlined the need to consider the urban morphology of the built environment surrounding the monuments of historic Cairo including all related residential, economic, social, and cultural features. Furthermore, the need for scientifically managed conservation plans was identified, with accurate surveys and documentation of historic buildings. This would form a foundation for potential conservation processes and clearly defined priorities for interventions.

The two key conservation projects in historic Cairo here discussed are the United Nations Development Program (UNDP) and Supreme Council for Antiquities (SCA) in Gamaliya district, and the Aga Khan Trust for Culture (AKTC) in Al-Darb Al-Ahmar district in historic Cairo. Those interventions have been selected for the review owing to their noteworthy approaches and outcomes.

2.4.1 UNDP Rehabilitation of historic Cairo

A consistent strategy for urban conservation of historic Cairo was undertaken by the UNDP and SCA in 1997 (UNDP & SCA, 1997) building on the

previous 1980 UNESCO plan that was not put into action (Sedky, 2009; Sutton & Fahim, 2002). The UNDP proposed a Framework Plan (FWP) that highlighted the interrelation between activities, transport, and infrastructure as important factors influencing the image of this World Heritage property.

The proposed FWP was based on a rehabilitation strategy targeting five urban zones of historic Cairo: the Heritage Corridor, the 19th Century Corridor, the Institutional Corridor, the Community Zone, and the Transformation Zone. The UNDP FWP comprised various principles proposed to improve the existing conditions in historic Cairo: identifying neighbourhoods with poor socio-economic and physical conditions that required interventions; assessment of the spatial components of the built environment including cultural heritage, urban fabric, and distribution of activities, traffic and infrastructure issues; and improving accessibility whilst respecting the organic nature of the urban fabric of historic Cairo.

The FWP suggested that "urban policies would guarantee a feasible implementation of rehabilitation strategies, while community participation was identified as another tool for protecting historic Cairo's outstanding value. The plan provided an important reference for large-scale urban rehabilitation actions in Cairo" (UNESCO, 2012, p.16). The Egyptian government supported the outcomes of the UNDP project in historic Cairo and agreed with UNESCO to update it and progress from it with the concurrent impacts of rapid demographic, environmental, urban, and cultural changes in the area.

This scheme resulted in a complete isolation of the governmental initiatives and efforts in conservation projects from the local residents affected with the conservation projects (SCA, 2002). Besides, it should be noted that many disagreements have arisen among the local community due to their neglect by the Government throughout the decision-making process in all project stages, where they believed the intervention priority was always for tourism development (UNDP & SCA, 1997). While the framework considered the five zones as an integrated urban entity of the historic city that needed to maintain the liveliness of the place, the UNDP project merely focused on the development of the Heritage Corridor zone. Although many monuments were

preserved in historic Cairo, most efforts were directed on the preservation of individual monuments and significant buildings without taking into consideration the local communities living in the area (UNDP & SCA, 1997).

2.4.2 Al-Darb Al-Ahmar Revitalisation (ADAAR) Project

"It is clear that in the 19th century a process began that heavily transformed the structure and image of historic Cairo, particularly its residential urban fabric" (UNESCO, 2012, p.26). Since 2000, with reference to the UNDP rehabilitation project of historic Cairo in 1997, the Aga Khan Trust for Culture (AKTC) established its urban rehabilitation projects, encompassing not only the construction of Al-Azhar Park but also the restoration of the 1.5 km section of the Ayyubid wall in Al-Darb Al-Ahmar district (AKTC, 2005a). The AKTC and its partner funding agencies, with support from the Cairo Governorate, the SCA and the local community, have developed a series of projects combining social and economic initiatives with the physical improvement of the Al-Darb Al-Ahmar district on the eastern side of historic Cairo (UNESCO, 2012).

The Al-Azhar Park project (see Appendix F) that was opened to the public in March 2005 also helped improve the image of the area and the city as a whole with its green landscape and vast open spaces (Bianca et al., 2010; Ibrahim & El Rashidi, 2010). The project was acknowledged by the local authorities, developers, and local residents to have improved the quality of life, to have enhanced the perception of Al-Darb Al-Ahmar district and to have represented a powerful attraction and incentive for change in the historic Cairo (UNESCO, 2012). Al-Azhar Park project has been described as "transforming and enhancing the image of the area as a whole, no longer a 'backyard' but an attractive foreground for Al-Darb Al-Ahmar (ADAA)" (Bianca, 2010, p.255). The Park acted as a catalyst for social, economic, and cultural sustainability with direct positive impact on the 200,000 residents of the neighbouring districts of Al-Darb Al-Ahmar (Salama, 2008).

The project also targeted monument restoration and adaptive re-use of the significant historic buildings to help prevent further deterioration and bring about the social improvement of the neighbourhood. Restoration preserves and

improves community assets and also provides an opportunity for social and economic development by creating jobs for local residents, training in traditional crafts, and enhancing the sense of place to community members. As for adaptive re-use of historical buildings, which is another viable method for rehabilitation, this always encounters bureaucratic problems in Egypt thus leading to deterioration of buildings after restoration (Bianca, 2007). ADAAR succeeded in reusing only four complexes of the 65 registered significant monuments which now have different functions in ADAA (Nour, 2010). *Khayer Bek complex,* which includes the Palace, Mosque, Sabil, and Kuttab, hosts offices and meeting rooms for vocational training programmes and re-uses the area at the back of the Khayer Bek complex as an open-air theatre. *Darb Shoughlan School* (see Appendix F) is currently used by Al-Darb Al-Ahmar Community Development Company (CDC). *Bab al-Wazir Gate* is used as an information point for the tourists. The *Um al-Sultan Shaaban complex* which comprises madrasa (school), mausoleum and Sabil hosts offices and meeting rooms for the employment career counselling of Al-Darb Al-Ahmar CDC (AKTC, 2005b).

The ADAAR continued upgrading the infrastructure and public open spaces in Al-Darb Al-Ahmar district, with the aim of improving the living conditions of the residents of the area. The Open Space Upgrading Activity worked on four main projects. Besides the completion of the infrastructure and streetscape for Atfet Asaad Street, the programme worked on upgrading the infrastructure in Aslam Square, and the Darb Shoughlan, Burg Al-Zafar, and Bab Al-Wazir neighbourhoods (CDC, 2008). Upgrading included paving streets and squares as well as installing drainage, sewage, electricity, and water connections to individual houses. In addition, the project worked on improving the waste management in Darb Shoughlan, a neighbourhood in ADAA, in coordination with the company responsible for solid waste removal in this area, and with the cooperation of the residents (AKTC, 2005b, p.29).

In spite of the architectural significance of Al-Darb Al-Ahmar and its lively community of traditional craftsmen, living conditions have declined due to the cumulative problems affecting the historic city over the years. Al-Darb Al-

Ahmar Revitalization Program (ADAAR) initiated its Housing Rehabilitation Program (HRP) in 2005 which aimed to improve the quality of housing in ADAA through rehabilitating deteriorated houses in the area (AKTC, 2005b). The rehabilitation project included significant measures and facilities that were required, such as adding lavatories, kitchens, and ventilation outlets to houses (CDC, 2008).

As for economic and financial support provided to local residents, Al-Darb Al-Ahmar Revitalization Project (ADAAR) represented by Al-Darb Al-Ahmar Community Development Company focused on micro-credit for business development, employment and training, housing rehabilitation, monument restoration, adaptive re-use of historical buildings, and infrastructure and open spaces as upgrading and development projects. Micro-credit for business development was led by the Aga Khan Cultural Services–Egypt (AKCS-E) of Aga Khan Foundation (AKF) and the Canadian International Development Agency (CIDA), while the Social Fund for Development (SFD) met the economic component with the required funds (CDC, 2008). Those bodies supported the socio-economic development of local communities, particularly women, where 50% of the loans have been granted to female borrowers to start up or improve income-generating activities (AKTC, 2005b).

The ADAAR project also targeted community development by providing opportunities for employment as the most effective tool for poverty mitigation and providing higher standards of living. Thus, ADAAR relied on the commitment of its key partners in Al-Darb Al-Ahmar to raise skills to increase employability that complemented ADAAR's efforts to serve the community (CDC, 2008). Providing employment opportunities was accomplished on two main levels; career counselling and training. The Employment & Training Program continued to provide beneficiaries with advice, counselling, and one-to-one assistance to develop career plans, whilst vocational and administrative training contributed to a better-educated and better-skilled labour force (AKTC, 2005b).

Thus, the project has been acknowledged for its positive outcomes and broad benefits for the community and the area as a whole. The local authorities

emphasised that this project could act as a starting point for further public and private investment in historic Cairo (UNESCO, 2012; Ibrahim & El Rashidi, 2010; Morbidoni & Allegretti, 2010; Sedky, 2009). However, there was a risk of overwhelming development initiatives that might lead to the danger of complete substitution of the traditional urban fabric and exclusion of current residents and activities (Morbidoni & Allegretti, 2010; Nour, 2010)

DISCUSSION AND CONCLUSION

Following the previous review of development interventions in the Old City of Aleppo, the historical area of Jeddah and historic Cairo; lessons learnt are outlined to support the approach of the present study. The cases discussed have provided accounts of the outcomes of the evaluation of the conservation projects in those historic sites and outlined the management systems and tools required to ensure their sustainability. Potentialities for and barriers to the interventions are highlighted to create a database that helps develop a tailored sustainable urban development strategy for historic Cairo following the previously discussed initiatives.

The rehabilitation project of the Old City of Aleppo emphasised the preservation of significant monuments of the old city along with its traditional residential buildings, therefore restoring the urban fabric as well as rebuilding the monuments. The project gained international recognition in sustainable urban development. It was acknowledged as one of the best practices of social sustainability in historic districts by UN-HABITAT (UN-HABITAT, 2008) and was also awarded the Green Prize in Urban Design by The Graduate School of Design at Harvard University in 2005 (Busquets, 2005). The project of old Aleppo helped raise planning performance standards in Aleppo and Syria by developing an information management system, introducing new technology and professional training and providing financial schemes such as housing micro-credit schemes. Moreover, knowledge transfer has been accomplished from this project to other planning projects in Syria and the Middle East such as the Al-Darb Al-Ahmar Rehabilitation Project, particularly the principles of participatory planning. The Rehabilitation Project approached

the Old City of Aleppo as a whole entity by introducing physical interventions along with socio-economic development activities. It emphasised that the old city would preserve its mixed-use context to include residential, touristic and commercial activities.

In the historical area of Jeddah, the intervention adopted a new strategy to resolve the problem of spatial isolation in the fragmented historic core. This has been achieved by reconnecting it to the citywide street grid while maintaining the integrity of local physical and spatial structures, thus creating maximum positive impact and an incremental upgrading with the least disruption to the existing historic core. By upgrading the spatial structure, residents were encouraged to maintain their own properties and plots to improve the overall image of their communities.

The international development project by GIZ intended to preserve the historic fabric of the old city of Aleppo whilst improving the social and economic conditions of local residents. Although the impact of the project did not cover the entire historic city, there were significant results in a few 'Action Areas'. Some significant problems that were not addressed during the rehabilitation project of the Old City, and which remain unaddressed, are still regarded as barriers to sustainability of the project. Fragmentation of ownership has been one of the obstacles, as some properties remain registered under the names of the legal owners with no official transfer of ownership made to their current owners, resulting in evolving into complex procedures for proper transfer of ownership. Another obstacle encountered has been the rate of continuous deterioration and the need for structural repair in more than half the buildings in the Old City. The lack of adequate infrastructure such as electricity and waste collection, among others, has been yet another challenge to the sustainable outcomes of the project.

The policies for intervention provided recommendations that did not consider the dilapidated living conditions of residents of this area. The minimal consideration given to residents has wrongly assumed that residents were traditionalists as opposed to modernists in their lifestyle. Another limitation to the project was the exclusion of social planning principles which did not align

with international standards for the conservation of historic cities at the time the project was implemented.

In the case of Jeddah, spatial interventions were developed based on a top-down approach which did not consider local residents' views or aspirations. This was undertaken through the support of Jeddah Municipality and JDURC. Thus, people residing in Jeddah were neither content nor satisfied with the spatial intervention developed and did not support the initiative. A reason for this could be that the majority of residents in Jeddah's historic core and the unplanned settlements are illegal immigrants who reside without official tenancy/ownership agreements, and are thus often suspicious of any initiatives for developing the area. Moreover, the intervention did not consider achieving holistic sustainability per se but focused only on physical sustainability.

Regarding interventions in historic Cairo, most of the recent and ongoing schemes for upgrading historic Cairo contradict the recognised theory and practice of area conservation as expressed in international charters and the 1998 UNDP study. Many state-led schemes focused on superficial conservation, concerned mainly with maintaining the old fabric. Pursuing an increase in tourism income, some of these schemes suggested permitting heavy traffic through the historic fabric, thus overlooking some important subjective factors, such as community well-being.

In addition, most of these schemes also overlooked the district's character, meaning, integrity, and authenticity. This was apparent in two of the major interventions in historic Cairo where, in the UNESCO proposal in 1980, physical improvements were supported whilst concepts of cultural sustainability were overlooked. However, the AKTC project in 2005 considered all concepts underlying the culturally sustainable conservation model (Salama, 2000).

Although several conservation projects are currently ongoing in historic Cairo, where many monuments and significant buildings have been preserved individually, there is no clear vision for a holistic approach to conservation. Another problem with the conservation process is that it took place in dispersed areas of historic Cairo across a long period of time (Nasser, 2003). Notably,

this caused the loss of visibility of some monuments and subsequently their role as landmarks, as they appeared instead as isolated structures in the urban context. However, significant interventions by the SCA and other national and international organisations should be acknowledged even if some of them had only limited impact in the area. It has been suggested that unless there is one powerful administrative body that takes control to oversee and coordinate potential interventions, many efforts made would probably be unsuccessful (Salama, 2000). A different approach of conservation policy is required to address the many challenges in historic Cairo, where new planning and management tools need to be set up progressively in line with the current international standards to ensure the sustainability of the area.

This chapter has provided an in-depth understanding of recent and previous rehabilitation projects in heritage sites in Aleppo, Jeddah, and historic Cairo. An overall concept extracted when considering the concept of sustainable urban development in Aleppo, Jeddah, and historic Cairo, is that there needs to be a simultaneous emphasis on rehabilitating the built environment whilst providing for people's needs, and enhancing education, health, equality of opportunity and environmental management. This chapter has also helped inform the research methodology adopted in the study which is further discussed in the following chapter.

CHAPTER THREE

RESEARCH METHODOLOGY

Chapter Contents

INTRODUCTION

The previously discussed rehabilitation projects in Aleppo, Jeddah, and historic Cairo have demonstrated significant aspects of development interventions in differently structured urban and socio-economic fabrics of historic Islamic cities. It is clear that sustainable development within the urban context of historic sites can benefit from a deeper understanding of the relational framework between and within stakeholder groups. This understanding is considered to be useful in developing principles for evaluating the current situation and proposing detailed design guidelines for sustainable urban development in historic Cairo. Thus, finding the optimum approach to developing effective interventions in such a critical context is fundamental.

The research rationale rigorously attempts to tackle the research questions in an evidence-based and theoretically informed manner. The study combines the use of qualitative and quantitative research methods by using a 'pragmatic' approach. This mixed methods approach has the benefit of combining different techniques, such as interviews and questionnaires, in order to explore more fully the context of a case study. Questionnaires are used to bring in the bottom-up insights whilst in-depth interviews are used to introduce top-down views. The combination of methods provides a basis for exploring how to enhance successful delivery of urban development interventions in a heritage site. The purpose of this chapter is to present and explain the research methodology by explaining the rationale of the research, followed by the research design model and case study before the limitations of the study are outlined.

3.1 CASE STUDY: HISTORIC CAIRO

Case study research is an approach in which the researcher explores either single or multiple cases through a detailed investigation, often with data collection over a period of time, to discover one or more events, programmes, activities, or processes (Stake, 2006; Stake, 1995). It could be identified as a strategy of inquiry, a methodology or a comprehensive research strategy (Creswell, 2007; Yin, 2003). A case study is often determined by time and

place and assists the researcher to use multiple sources such as in-depth data and a variety of research methods (interviews, observations, reports, and documents from official meeting or informal interviews), as part of the investigation (Denscombe, 2007). Besides, questionnaires can be used within the case study to provide information on a particular issue of interest, dealing with a physical, social, historical, or economic setting (Creswell, 2007). An advantage of the case study approach is that it delves into deep levels of detail to examine a given situation (Denscombe, 2007).

In case study research, the researcher first identifies the case and the bounded system and asserts that it is suitable for research in terms of providing an in-depth understanding of the cases or a comparison of several cases. Moreover, if a collective case study approach is adopted, cases with different perspectives within the problem process should be selected. (Creswell, 2008; Creswell, 2007; Denscombe, 2007). Case studies could either be a single instrumental case study, collective or multiple case studies, or an intrinsic case study. The latter focuses on a unique or unusual case (Stake, 2006). The researcher describes the unique case in ways that differentiate it from the others, based on a collection of features or the sequence of events.

This study explores historic Cairo as an instrumental case study that affords a thorough understanding of the specific requirements for sustainable urban development in one of the world's unique heritage sites. Cairo is a unique city, and the thousand-year-old historic area (which actually consists of several detached districts and, unlike many cities in the Arab world, such as Damascus and Baghdad, which have been repeatedly attacked by invading armies and left with their original layout and structures damaged) is one of the world's few surviving medieval cities that remains intact. In fact, historic Cairo retains many of the same streets and buildings added to the city during the course of the last millennium (HCP, 2007; Siravo, 2001).

Historic Cairo is of international significance, prominent physical urban character and strong social identity. In 1979, historic Cairo was designated as a world heritage site by UNESCO (Jokilehto, 2011; Abu-Lughod, 2007; Siravo, 2001; UNDP & SCA, 1997). The historic components that survive to this day consist of significant monument clusters that evoke a traditional sense of place

in the pedestrian experience (Sedky, 2009). Moreover, the social patterns of the local communities are strongly traditional and have historically manifested a sense of belonging to the area because most people both work and live within historic Cairo. These communities, nonetheless, have been in a state of transformation, in response to the changing economic and social conditions during Egypt's recent history (Abu-Lughod, 2007).

Consequently, due to rapid urban changes, for decades, historic Cairo has suffered from a range of serious problems. These problems arise from the gradual erosion of the traditional urban and social fabric of the historical areas, the lack of necessary maintenance of the buildings, and the collapse of their infrastructure, and the lack of funding for urban conservation (Sedky, 2009). These combined factors have led to the deterioration of various important traditional and historical sites in historic Cairo; and several have been completely destroyed (Abada, 2008).

3.2 THE RESEARCH DESIGN MODEL

The research design model comprises three aspects that together form the comprehensive research plan; the philosophical worldview, strategy of inquiry and research methods (Creswell, 2008). It is first important to highlight the research problem and plan the use of appropriate methods to understand the problem and produce effective solutions. Most of the recent development interventions in historic Cairo have failed to consider holistic sustainability as a primary target. The sustainable development strategy that the research proposes builds on the challenges and opportunities outlined in previous studies and development projects discussed in the preceding chapter (Ibrahim & El Rashidi, 2010; Jeddah Muncipality, 2009; UNESCO, 2009; Hillier et al., 2008; Nebel & Spiekermann, 2008; UN-HABITAT, 2008; Bianca, 2007; AKTC, 2005b; SCA, 2002; UNDP& SCA, 1997; UNESCO, 1980).

The study employs the pragmatic worldview which is not devoted to a single philosophy, but relates to both qualitative and quantitative methods (mixed research methods). Pragmatism is generated from actions, situations, and consequences (Creswell, 2008). It also expresses its significance by focusing on the research problem and then using a "pluralistic approach" to create

knowledge about the problem. Mixed methods researchers are searching for many approaches to collecting and analysing data in order to understand and solve research problems (Ridenour & Newman, 2008). Thus, for mixed methods researchers, pragmatism encourages the application of different views, methods and assumptions as well as data collection and analysis. The researcher is able to choose freely the methods, techniques, and procedures considered most appropriate for the research with a pragmatist approach (Creswell, 2008).

As for the strategy of inquiry adopted in the study, a mixed method strategy with an in-depth case study is used. This strategy utilises the strengths of both quantitative and qualitative data and analysis, combining both emerging and pre-determined approaches. The researcher combines both quantitative and qualitative data in order to provide comprehensive analysis of the research problem and show similarities or inconsistencies in the results (Creswell & Plano Clark, 2011; Creswell, 2008). In the mixed model approach adopted in this research, a concurrent embedded strategy is employed as the most appropriate strategy. This concurrent mixed method is chosen to facilitate the use of different methods to study different groups and levels, thus gaining diverse perspectives from varied types of data. The researcher collects both forms of data simultaneously and the information is then combined to interpret the result (Creswell, 2008; Groat & Wang, 2002).

A parallel strategy of inquiry adopted in this research, along with the mixed method strategy, is 'logical argumentation'. Logical argumentation was developed by Socrates and his followers to make "sense of some aspect of the cosmos in a systematically rational manner" (Groat & Wang, 2002, p.301). In his case, Socrates mentioned that "knowledge was the heading, and the goal of the exercise was to frame a logical system that can explain any instance of knowledge" (Groat & Wang, 2002, p.301). However, Socrates's proposal was not flexible enough to accept all instances of knowledge. Groat and Wang (2002) proposed a spectrum of architectural literature ranging from where an argumentation depends upon equations and mathematical rules at one end, as in Figure 3.1, to the other end that identifies its logical consistency from its

cultural world views. Between these two poles lie the logical systems that share elements of both mathematical-formal systems and cultural-discursive ones.

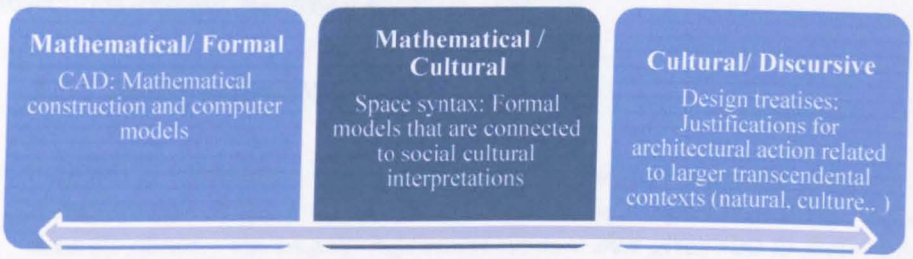


Figure 3.1Spectrum of logical argumentation (Source: Groat & Wang, 2002, p.303)

The space syntax technique lies in a logical system and is related to both mathematical-formal and cultural-discursive. Similar to mathematical-formal systems, space syntax uses numerical factors and equations in its analyses of space and forms, but the output of the resulting data highlights the social cultural value (Groat & Wang, 2002, p.304).

As the study adopts the mixed method approach, with historic Cairo as a case study, a number of requirements have emerged when investigating the current conditions in historic Cairo. The data collection process needs to be in tandem with the mixed methods design of the study. The study uses procedures drawn from concurrent embedded forms of data collection, in which both the quantitative and qualitative data are collected concurrently (Creswell & Clark, 2011).

The case study of historic Cairo has been undertaken by using a variety of data collection and analysis methods. Firstly; a series of in-depth interviews and questionnaires is used to map the personal constructs of a broad category of individual stakeholders and explore their expectations and aspirations in the development of historic Cairo. In addition, the questionnaire aims to engage a variety of stakeholders' opinions and views in the process of developing historic Cairo. Space syntax technique is applied where integrated and segregated street segments have been examined in detail (chapter six). The general survey results and correlation results support space syntax measures to provide viable design guidelines for a sustainable urban development in the area, in light of particular design principles suggested in several studies (Smart Growth Network, 2011; Carmona, 2009; Clarke, 2009; EU Working Group on

Urban Design for Sustainability, 2004; Rogers, 1997; URBED,1997; Barton, 1996; Haughton & Hunter, 1994; Bentley et al., 1985). The following subsections explain the data collection methods.

3.2.1 In-depth interviews

> *One of the advantages of the in-depth interview over the mass survey is that it records more fully how subjects arrive at their opinions. While we cannot actually observe the underlying mental process that gives rise to their responses, we can witness many of its outward manifestations. The way subjects ramble, hesitate, stumble, and meander as they formulate their answers tips us off to how they are thinking and reasoning through political issues.* (Gerring, 2007, p.45)

The rationale for using in-depth semi-structured interviews in this research rather than standardised interviews is to allow the researcher to probe for details that would be impossible to anticipate in a standardised script. The researcher may also be in a better position to make judgments as to the veracity and reliability of the respondent. Interviews can take a variety of forms depending on the type of data required to inform the research questions and the availability of resources.

A semi-structured interview is the type used in this study. It incorporates elements of both quantifiable, fixed-choice responding, and the facility to explore and probe in more depth certain areas of interest. This type of interview carries with it the advantages of both approaches in that it is generally easy to analyse, quantify and compare, but also allows interviewees to explain their responses and to provide more in-depth information where necessary (Brewerton & Millward, 2001).

In-depth interviews are conducted with key individuals from government authorities, practitioners, NGOs, private sector investors, international aid organisations, and local urban planners and architects. Those experts have either led or been involved in key urban development projects in historic Cairo or/and Greater Cairo. The experts and professionals have been drawn from the Supreme Council of Antiquities (SCA), the Central Organisation for Public, Mobilisation, and Statistics (CAPMAS), the General Organisation for Physical Planning (GOPP), the Centre for Conservation and Preservation of Islamic Architectural Heritage (CIAH), the Ministry of Planning and International Cooperation, the National Organisation for Urban Harmony (NOUH), the

Housing and Building Research Centre (HBRC), the Aga Khan Trust for Culture (AKTC), and the N.A.D.I.M. Centre (see Appendix E for interviewee details). This is to help structure a database of informative guidelines of how people and organisations need to be better empowered and integrated into the decision-making apparatus. A total number of 12 semi-structured interviews have been initially the researcher's target. However, due to logistical reasons, two of the interviewees apologised for not being able to attend; thus a total of 10 in-depth interviews have been conducted and analysed.

3.2.2 Questionnaire and fieldwork procedures

The questionnaire is used in the study to determine stakeholder views in historic Cairo. By considering all aspects of local community welfare, a proposed scenario that aims to achieve sustainable development supported by community and stakeholder participation is deduced and examined against existing policies. In the following subsections the geographic domain of the survey is defined, and the questionnaire design, sampling, and fieldwork procedures are explained.

3.2.2.1 Questionnaire Design

This survey questionnaire has been developed from three main sources; the Income, Expenditure, and Consumption Survey (IECS) form used for the CAPMAS census survey which has gone through a number of iterations to meet standards required by the Egyptian Government for dialogue with the tenants; historic Cairo survey, developed by the UNDP and SCA; and Al-Darb Al-Ahmar survey form disseminated by AKTC. The resulting questionnaire, although a simple five-page format, provides a comprehensive data collection document that allows for all eventualities, and which is quite simple for the majority of participants. The questionnaire has been translated and reedited from English to Arabic and revised by two professional editors to check the two versions are clear and logical. The questionnaire has then been sent to CAPMAS and the Local Authority for review and feedback before being finalised and used by the researcher.

The questionnaire aimed to allow the participant to relax into the conversation and say what they actually believe rather than a quick response to what they

think they should say. The questionnaire consists of a combination of open and closed questions, multiple responses, and Likert scales that tackle the research questions. Two specific open–ended questions are asked; one related to the aspirations and concerns towards developing historic Cairo and the other about attitudes towards conservation interventions.

The questionnaire comprises three sections, besides a covering letter that introduces the researcher and the research undertaken. It also provides ethical declarations from the researcher's side towards the participants in terms of confidential use of data collected for research purposes only. The first section includes all personal information (keeping the name as an optional question) consisting of demographic information and other questions about the stakeholder group, employment, means of transportation, etc. The second section asks for participants' perceptions and views concerning problems, potentialities, and overall experience of historic Cairo. The final section records participants' attitudes towards participation in the development of their area and their views of current development interventions (see Appendix C for the questionnaire form).

3.2.2.2 Geographic domain in historic Cairo

The geographic domain of the survey comprises two districts: Al-Darb Al-Ahmar, and Gamaliya. The area is defined by historic boundaries and physical barriers within a vague administrative authority. It covers an area of 3.22 square km and stretches along a north-south axis from the Bab al-Nasr and Bab al-Futuh to Ibn Tulun Mosque and along an east-west axis from the Historic Wall to the east of Port-Said Street (see Appendix A). The historic area is inhabited by approximately 131,428 inhabitants (CAPMAS, 2009). According to this, any household living or working within the urban zone of those two districts of historic Cairo at the time of the survey is eligible for inclusion in the sample.

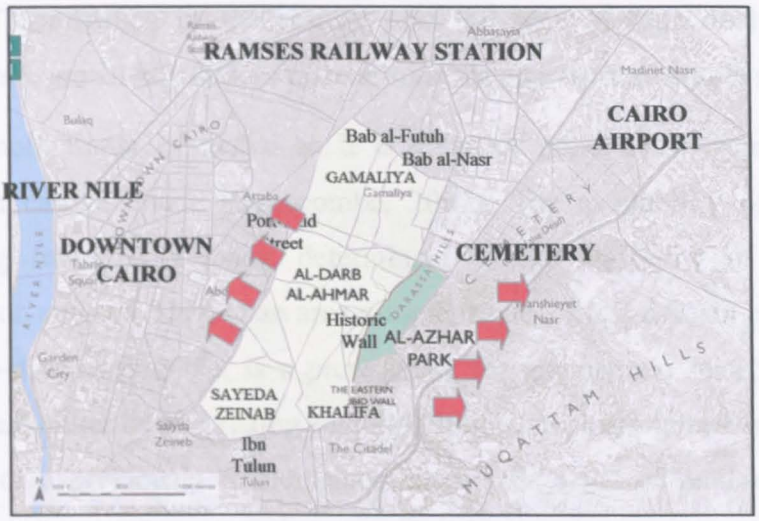


Figure 3.2 Urban Zones of historic Cairo (Source: adapted from Bianca, 2007)

The Central Agency for Public Mobilization and Statistics (CAPMAS) is, by law, the sole agency in Egypt responsible for conducting population censuses and authorising other bodies to conduct surveys. Accessing micro-level population data is not possible without CAPMAS involvement and approval. Accordingly, CAPMAS represents the only legitimate source for sample frames on the national level.

3.2.2.3 Sampling method

In planning for a survey, a decision should be taken about the size of the sample. The determination of the sample size involves balancing the demands for analysis with the feasibility of implementation and the constraints of timing (Denscombe, 2007). The decision on size is an important one, as too large a sample implies a waste of resources and time, whereas too small a sample diminishes the utility of the results. The decision cannot always be made satisfactorily as often researchers do not possess enough information to be assured that the best sample size is chosen.

Surveys used in social research do not necessarily have to use samples of 1,000 or 2,000 people. Whatever the theoretical issues, the simple fact is that surveys and sampling are frequently used in small-scale research involving between 30 and 250 cases (Denscombe, 2007). Decisions on sample size are affected by how much variability is expected in the population from which the sample is drawn. In addition, the accuracy with which estimating results is required, the

level of confidence in the results, and the type of data analysis that is anticipated, are all key factors to determine the appropriate sample size needed.

The sample frame is crucial as it is a list of populations from which the selection can be made (Denscombe, 2007). The availability of a suitable sampling frame is a major determinant of the feasibility of conducting population surveys. Having an area sample frame, of full-domain coverage and as up-to-date as possible, is a prerequisite for any sample selection process. This could either be an existing sampling frame, an existing master sample, the sample of a previously implemented survey, or a list of randomly selected enumeration areas from a recently completed census.

According to CAPMAS, the published results of the 2006 Population Census, the total population of Egypt reached 73 million inhabitants. About 43% live in urban areas (31,370,925 inhabitants) that are distributed over 27 governorates. It has estimated that slightly more than 15.8 million inhabitants live in the urban zone of Greater Cairo, and among these 6.75 million inhabitants live in urban Cairo city (CAPMAS, 2009). The research sample design is based on the probability sampling technique which indicates that the researcher has chosen the sample with a prior knowledge that the sample will be a representative cross section of people in the whole population studied; in this case, the population of historic Cairo. The specific approach used for sampling is the stratified sampling, where "every member of the population has an equal chance of being selected in relation to their proportion within the total population" (Denscombe, 2007, p. 14). For this study, every hundredth household in historic Cairo listed in the CAPMAS register has been selected. The overall sampling fraction used is 0.14% calculated as the total number of respondents divided by the total population in historic Cairo.

The sampled participants within this survey are stakeholders of Al-Darb Al-Ahmar and Gamaliya districts that include community members, NGO members, property owners, retailers, and informal sector enterprise workers. In order to obtain a large number of responses from the public, with high confidence, the researcher excluded the following as suggested by CAPMAS: (i) people who are too young – less than 16 years old, (ii) people with poor

eyesight - to read/see and respond, and (iii) people who have been living or working less than six months in historic Cairo.

3.2.2.4 Pilot questionnaire

Prior to distributing the questionnaire to the targeted sample, the questionnaire was first tested to ensure that it performs as intended. It was handed out to six residents from historic Cairo and six Egyptian PhD students (who are well-acquainted with HC) at the University of Nottingham for comments and feedback. These participants were chosen either as stakeholders in historic Cairo or for their general knowledge and experience as constant visitors to historic Cairo. The researcher requested that these participants complete the survey and provide feedback. Following this, they suggested a few amendments of the wording in the questionnaire in order that these were clearer to laypeople.

The pilot allowed the questionnaire and the data transfer mechanism to be fully tested and identified questions that needed clarification, questions that needed to be introduced and questions that were irrelevant. The researcher was advised to modify or delete questions that were anticipated may make respondents uncomfortable about responding to; such as questions asking respondents' views on political issues. Another benefit of the pilot has been to demonstrate the importance of personal contact with respondents that enhances the response rate in a relatively short period of time.

3.2.2.5 Data production

The revised questionnaire was distributed to the public on a daily basis between 31 March and 3 May 2010, between 8 am and 7pm. It was distributed and collected personally by the researcher with the assistance of two colleagues. In order to conduct this survey, official permission from various authorities was sought (e.g. CAMPAS, SCA, MOE, CG and MOI - Home Office) before the survey was conducted. These complicated stages of bureaucracy and paperwork have affected the work progress.

The researcher spent five weeks in historic Cairo conducting questionnaires, recording observations and taking photographs. The researcher had the advantage of first-hand experience with participants through informal

discussions and helpful photographic images that describe the current status of the area. These informal discussions brought to light other aspects that the researcher was unaware of and was subsequently able to record as additional information during his observations. In addition, this helped him focus on the often ignored issues that impact on people's livelihoods and well-being, although some issues proved difficult for participants to discuss.

A sample of 240 households was initially targeted. The non-response and refusal rate for completing the questionnaire in this paper-based survey accounted for 25% (60 out of 240 respondents approached). In total, 180 responses were obtained while excluding the 12 respondents who had participated in the pilot study. The main reason for obtaining a relatively high response rate was due to the door-to-door approach to the target sample, along with securing people's trust by presenting a supporting letter from CAPMAS approving the survey.

The data collected was entered to SPSS and the coding included identifying valid responses to the closed, semi-closed and multiple response questions as well as to responses to the open-ended questions. Each coded response category has been used as a variable in SPSS for subsequent statistical analyses. SPSS software was exploited to produce descriptive and frequency statistics and to perform regression analyses tests used to compare levels and rationale for motivating participatory actions in historic Cairo. Variables have been grouped under three categories in SPSS; nominal questions (yes, no), ordinal questions (never, sometimes, often), and Likert scale questions (5-point scale questions). Consequently, the study has investigated the correlations and significances of multiple variables and generated important outcomes.

3.2.3 Space syntax analysis

The researcher was recruited as an intern in space syntax, London for four months in 2010, where he participated in several projects in the Middle East and the UK. The present research applies the space syntax technique to the most relevant example, The Historical Area of Jeddah, where the analysis has created a very powerful method to define the historic core and how it is impacted by the new developments. The researcher used an integrated spatial

model weighted by land use, density, and population on the studied case of historic Cairo; he also used both space syntax softwares, Depthmap (see Appendix B) and Confeego, fully integrated with MapInfo GIS as the starting point for the analysis. This method has been used in assessing the current conditions, where there is uneven distribution of buildings and densities, and in assessing new urban developments in the area of study. Besides, other factors have been taken into account such as land use and density.

The following subsections explain some of the theories and methods of space syntax, most important applications, syntactic measures, and limitations of the technique. These subsections aim to support the understanding of the spatial conditions of historic Cairo.

3.2.3.1 Space syntax theory and methods

The term 'space syntax' was conceived by Bill Hillier, Julienne Hanson and their colleagues at the Bartlett School of Architecture, UCL in the late 1970s to early 1980s, (Hillier, 1996; Hiller & Hanson, 1984). The notion of syntax, derived from linguistics, refers to relationships between different spaces and examines the relationship between the patterns of space and its impact on human activity. Space syntax is an analytic theory of architecture and urban design built on the careful first-hand study of buildings and cities. Space syntax is defined as "a model for representation, analysis, and interpretation" (Hillier et al., 1987, p.217). It is an analysis that enables linking abstract network concepts to the real world of people and behaviour, hence its value as a design, planning and decision-making tool (Karimi & Parham, 2008). Bill Hillier and Julienne Hanson's work converts an architectural plan into an "axial map." The map takes into account metric distances and comprises a set of lines drawn through the space in a two-dimensional plan of a building or an urban area (Turner et al., 2005). Space syntax technique show how patterns of social behaviour relate to surrounding space (Hiller & Hanson, 1984).

Space syntax studies, as with many other studies, take architectural and urban phenomena as data for building theories of urban form and function (Carmona et al., 2010; Hillier, 1996). These studies involve the patterns of space formed within and between buildings and investigate this dual relationship between

society and space. Space syntax theory asserts that not only does a society create the spaces that it uses, but a community (residents of a settlement or the users of a complex building) is further affected or influenced by the system of spaces it inhabits (Hillier, 1996; Hillier & Hanson, 1984). Space syntax investigates how society and culture affect space by studying how different cultures shape domestic space, how users create and use space, and how socio-economic factors shape space. On the other hand, it also looks at how space influences society in all the formerly mentioned aspects (Hillier, 1996).

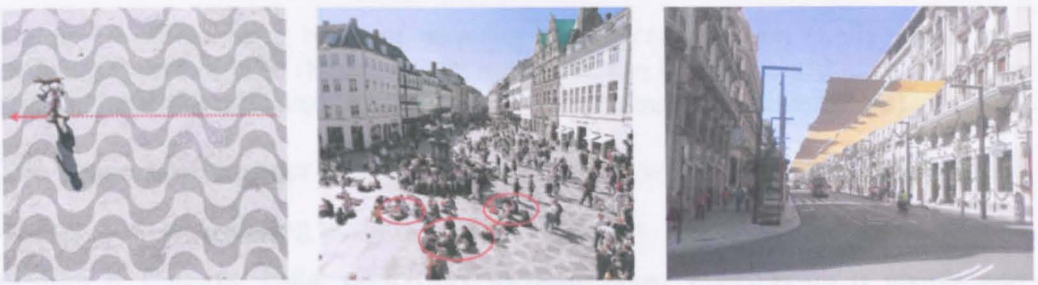
3.2.3.2 Space syntax applications

Using space syntax principles, human displacement patterns in a city can be analysed, mainly by considering the degree to which urban spaces are integrated and connected. Many empirical studies have demonstrated the importance of space syntax for the modelling and understanding of urban patterns and structures (Jiang & Claramunt, 2002; Hillier, 1996). Space syntax studies the principles that have been used when designing space. It can be introduced as an attempt to make explicit the spatial relationships that underlie our everyday experience of the designed environment and the way it functions both culturally and socially.

As a technique, space syntax has direct application for architects, planners, and designers seeking to understand the influence of spatial configuration on social activity. Through the structural analysis of an urban environment, urban planners can derive a better understanding of the evolution of urban areas, and gain more insight to help with the design of new urban layouts. This can be achieved by translating the way social and spatial aspects simultaneously affect each other in both micro- and macro-scale relationships; as well as understanding their transformation through time (Karimi & Parham, 2008).

In addition, space syntax has provided important computational support for the development of spatial morphological studies, in particular for the analysis of urban systems (Jiang et al., 2000). Confeego is a suite of tools to recognise and control the effects of spatial configuration in urban systems or complex buildings developed by space syntax. It covers a range of tools that are useful to projects involving the classic Space syntax analysis related to topological

depth (Gil et al., 2007; Hillier, 1996; Hillier & Hanson, 1984) and other tasks related to data collection, statistical analysis and visualisation. Confeego is a plug-in for the MapInfo Professional GIS (Gil et al., 2007). A collaborative integration of space syntax into GIS offers new perspectives of the development of urban morphology studies (Jiang & Claramunt, 2002).



Axial space Convex space Isovist space

Figure 3.3 Fundamental aspects of Space Syntax, (Left) People move in lines, (Middle) People interact and gather in convex spaces, (Right) People move through space, changing visual views. Source: (Karimi & Parham, 2008; Hillier, 1996)

Spatial configuration is defined in space syntax as the relationship which takes into account other relations; how spaces within the system relate to each other interdependently. Spatial configuration explores the relation of spatial pattern in terms of social relations, besides exploring the functional aspects of an urban area. These functional aspects include land use, pedestrian movement, crime, and social and economic aspects (Karimi & Parham, 2008; Hillier, 1996)

Three basic types of mapping of the given spatial configuration are the convex, axial and isovist spaces and maps. The convex space is the polygon which comprises all the lines forming its perimeter, whereas the axial line is the longest line within a convex space that links the convex spaces (polygons) together, related to visibility. The isovist space is the total area that can be viewed from a point in three dimensions; axial line, convex space, and isovist space, as illustrated in Figure 3.4 below.

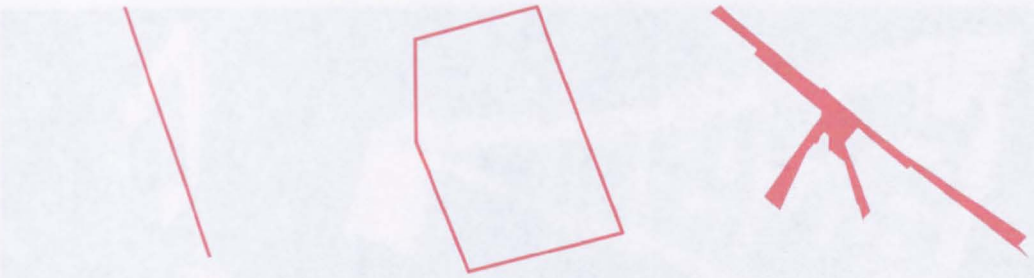


Figure 3.4 Three basic types of mapping spatial configuration (Left) Axial line, (Middle) Convex space, (Right) Isovist space. All can be represented mathematically and the properties measured (Source: Karimi & Parham, 2008; Hillier, 1996)

The procedure of generating the convex map involves taking a given spatial setting and partitioning it into a set of "fewest and fattest" convex spaces (Hillier & Hanson, 1984, pp.97-98). In these maps, every point is visible and accessible to every other point within the system and becomes less associated with movement (Bafna, 2003; Hillier & Hanson, 1984). The axial map is drawn on the basis of another discrete map overlaid on top of the convex map, consisting of globalised, one-dimensional lines that capture the structure of movement. It consists of the fewest and longest sets of lines of sight and access that cross at least two adjacent convex spaces (Choi et al., 2006; Hillier & Hanson, 1984). The resulting network of intersecting straight lines is the axial map, which is easily represented as a graph where each line is represented by a node and each intersection as an edge (Bafna, 2003).

Once an axial map is established, it can be used as the basis for calculation of various relational properties of the geometry of an environment (Choi et al., 2006). The relation between convexity and axiality conveys two sets of information; local information from the convex organisation, and partial global information from the axial organisation. Isovist maps represent the areas that are visible from convex spaces or axial lines.

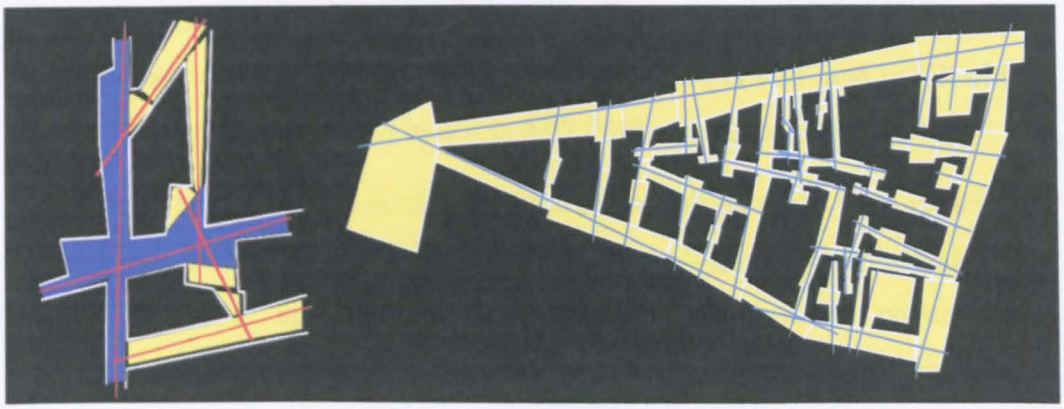


Figure 3.5 (Left) Axial lines, convex and isovist spaces, (right) axial lines and convex spaces in a section of the city of London (Source: Karimi & Parham, 2008)

Figure 3.5 illustrates that every urban space layout is made up of a system of lines, a system of convex spaces, and a system of fields of view (isovist spaces) that interrelate in a unique way. Axial lines (lines of sight) often pass through a whole series of convex spaces. However, the breaking up of space into identifiable local volumes does not happen at the cost of the inter-visibility of spaces (Karimi & Parham, 2008). This is the key way in which urban space conserves intelligibility by following the system that the lines pass through the convex spaces, as in the cut-out from the City of London (Figure 3.5 right).

Space syntax application in historic Islamic cities

Space syntax analysis of historical sites focuses on both spatial and social aspects of historical sites. In addition, it describes patterns of spatial layout and relates these patterns to social activities such as movement, behaviour and even social meaning and interpretation. Space syntax analyses the architectural style and characters, social life and activities within the urban fabric, and to different extents, examines other issues related to the environmental and physical conditions of buildings (Mohareb, 2009a).

Hillier and Penn (2004) have indicated that in certain kinds of urban layout, the phenomenon of 'just about' axiality occurs; where sometimes a line of sight may be 'just about' allowed, and other times may be 'just about' broken. In the City of London, the phenomenon of 'just about' allowed axiality is regularly observed; this is contrary to the case in many Islamic cities where the opposite occurs. It has been found that alignments are regularly 'just about' broken in spite of the general linearity of space in many Islamic cities. This causes

consistent statistical differences between various cities across the world. Notably, the mean line connectivity in European cities is 4.61, and in UK cities it is 3.71, whereas in Islamic cities it is 2.97 (Hiller & Penn, 2004, p.501).

The Islamic street network is characterised by "significant functions of several space-syntax-related indices as well as image-analysis and graph-theoretical indices. A set of space syntactic indices was found to be powerful to distinguish an Islamic network" (Kubat et al., 2012, p.36.1). Typical features of Islamic street networks include an overwhelming amount of organic networks, a large number of cul-de-sacs, winding and narrow roads and minimum numbers of main streets (Kubat et al., 2012). The main streets, whenever they exist, are defined to illustrate some structure in the urban grid of the Islamic city. As for residential neighbourhoods in old Islamic cities, a unique feature is the organic street network which makes it segregated and isolated, emphasising the prominence of privacy as a requirement for neighbourhoods.

3.2.3.3 Syntactic measures of space syntax

The measurements of the spatial properties of street networks applied in historic Cairo have been estimated by using the axial map representation. The three applied space syntax analysis methods of a street network are 'integration', 'choice', and 'connectivity'. These methods of analysis are explained below.

'Integration' or 'global integration' is an indicator of how easily one can reach a specific line. Mathematically speaking, it is the average number of spaces that one needs to pass through to reach a specific line from all the axial lines in a system. Integration is calculated as the node count divided by the mean depth or the node count square divided by the total depth. In a global model, node count is uniform for all spaces, but locally both total depth and node count vary from segment to segment (Ferguson, 2009).The values above 'one' denote a strong integration, while the values between 0.4 and 0.6 show more segregation (Choi et al., 2006; Kim & Sohn, 2002; Hillier, 1996). These values suggest the extent to which a selected space in the system is more integrated (can be easily reached from other spaces), or more segregated (one has to travel through many spaces in order to reach that selected space) (Hillier, 1996; Hillier & Hanson, 1984).

'Choice' analysis is considered to represent the number of intersections that need to be crossed to reach a street. Space syntax argues that choice values often predict the car traffic flow of streets. However, flow values are divided, not subtracted, at each intersection, and the output shows an exponential distribution. It is considered best to take a log of base two of the final values in order to get a more accurate picture. Like 'integration', 'choice' analysis too can be restricted to limited local radii; for instance, 400m, 800m, 1600m, etc.

'Connectivity' is another local measurement of the system which shows how many lines are directly connected to a specific line. It is defined as a property that can be seen from each space; for instance, wherever one is in the space, one can see how many neighbouring spaces it connects to. On the other hand, integration cannot be seen from a space, since it sums up the depth of that space from all others, most of which cannot be seen from that space (Kim & Sohn, 2002; Hillier, 1996, p.94). Intelligibility is described as the degree of correlation between the connectivity and integration values of the lines in the system.

The map is coloured using the full colour spectrum; red for the most accessible (integrated) through the colour spectrum to blue for the least accessible (segregated). This is illustrated in Figure 3.6 below, which shows the spatial accessibility of Greater Cairo and historic Cairo (outlined in black). As historic Cairo expanded over time, this expansion was driven by two competing forces, radical growth around the historic core and linear growth along the eastern bank of the river Nile. This is further explained and illustrated in chapter six.

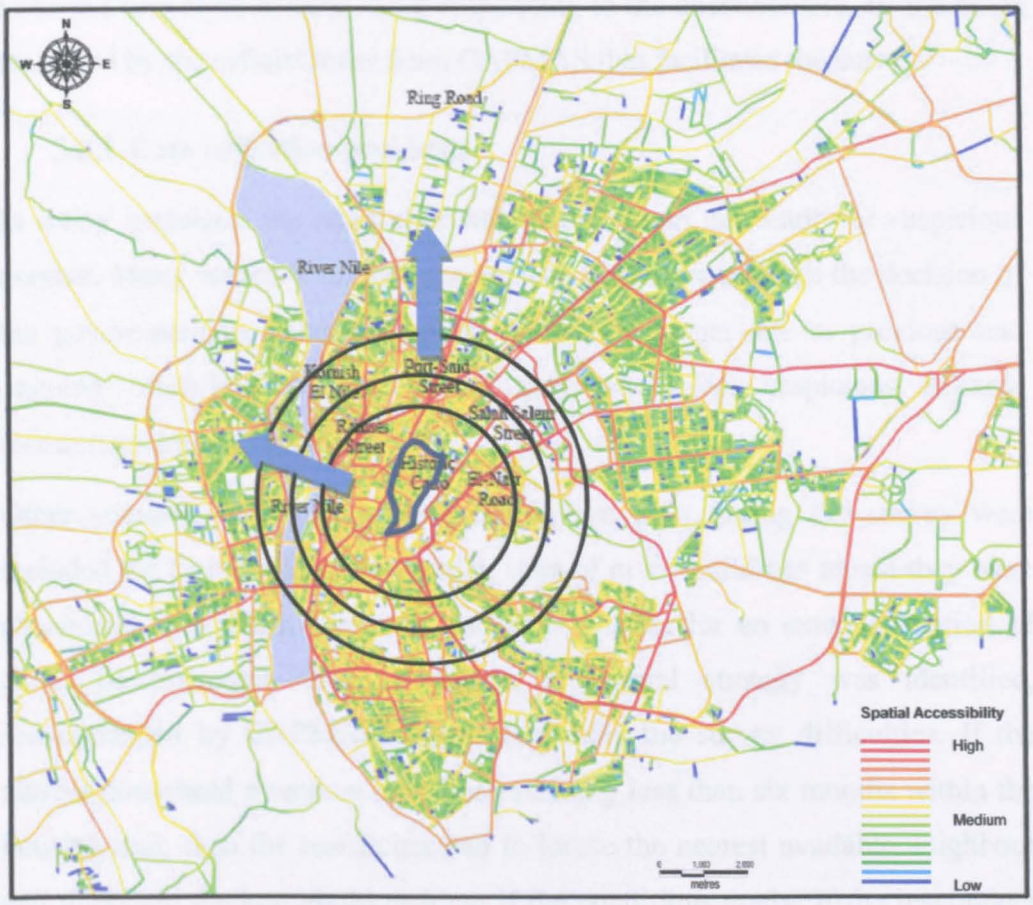


Figure 3.6 Greater Cairo wide scale (historic Cairo outlined in black): Spatial accessibility representing historic Cairo as a centre of Greater Cairo with its surrounding areas (Source: the researcher)

According to cognitive perception, space can be measured at two scales - either large global scale (Rn) or small local scale (R800m, R1200m). At the global scale, space is beyond human perception and cannot be perceived from a single vantage point (See above), while the awareness of small-scale spaces while moving through a large-scale space represents a prerequisite for the perception of large scale environments (Jiang et al., 2000). A large-scale space can be represented as an infinite number of interconnected small-scale spaces.

3.3 LIMITATIONS OF THE STUDY

The researcher faced several limitations whilst conducting the questionnaire during April 2010, a few months before the 25th January 2011 revolution in Egypt. Egypt's current socio-economic problems are mounting; these include the poor treatment of residents, increasing rates of unemployment and poverty, high inflation, collapsing socio-economic infrastructure, and failing education and health systems. All these factors besides others led some of the residents of

historic Cairo to be cynical about responding to the questionnaire, before being reassured by the official letter from CAPMAS that facilitates the survey.

3.3.1 Data collection problems

In a few instances, the researcher was treated in an unfriendly or suspicious manner. Many residents in this area are usually concerned with the decision of the government to relocate them to other settlements due to previous and ongoing rehabilitation projects, so they often feel suspicious towards researchers and surveyors.

Other common problems experienced in the field during the survey were included the fact that the deteriorating state of many buildings meant they were abandoned, and many dwellings had stood vacant for an extended period of time. To overcome those problems, a general strategy was identified, recommended by CAPMAS experts to handle the survey difficulties. If the current household members have been residing less than six months within the housing unit, then the researcher had to locate the nearest available neighbour and interview the household resident if the conditions apply. If the respondent could not be reached within the area, but the given address was reachable, then the researcher would interview the current resident.

The researcher had planned in the early stages of the research design to contact the interviewed local authority representatives and experts (see Appendix D for in-depth interview form) as a second phase of follow-up for consultation concerning the proposed design guidelines. However, due to the political unrest and chaotic circumstances in Egypt after the recent revolution, it has not been possible to physically meet and interview those participants. Thus, the researcher contacted them via email and managed to receive some constructive recommendations that helped him revise the proposed design guidelines.

3.3.2 Limitations of the space syntax technique

Although space syntax has been widely applied in the analysis of various types of building patterns and urban contexts, the technique has always been controversial (Ratti, 2004; Osman & Suliman, 1995). Many of the issues are due to the fact that some methods and measures of implementing the theory

have not been considered (Batty & Rana, 2004). Some points of limitations are discussed by the Massachusetts Institute of Technology (MIT) and other researchers regarding several issues; these are discussed below.

Space syntax has been criticised in several aspects within the space syntax community, particularly in the past 10 years. Criticism researched its peak after MIT recently released a new fundamental analytical tool in 2011 that integrates with ArcGIS software; the Urban Network Analysis toolbox. This toolbox is different from other syntactic tools that operate with two network elements, nodes and edges, as it includes buildings as the third network element. The toolbox computes five types of network centrality measures on spatial networks: Reach; Gravity Index; Betweenness; Closeness; and Straightness and was originally developed for the analysis of urban street and building networks, in addition to other spatial networks (railway networks, utility networks, among others). Kayvan Karimi, director in Space Syntax Limited, has praised the MIT toolbox and claimed that new attempts to develop fundamental analytical tools should be encouraged. However, he asserted that previous efforts in the field should not be underestimated and should be referenced to in any technique that has been developed from preliminary work done (Karimi, 2012).

One of the limitations of using syntax graphs in MapInfo GIS is that a coloured network of lines is used to represent the built environment which then becomes a logical component of analysis. However, the process of colouring the segments raises two problems for non-specialists; the complex choice of colours and the choice of classification used. The colour scheme used in space syntax graph is a 'complex full spectral colour scheme' which ranges from warm red through green and yellow to cold blue. However, this can be problematic as it can be confused with the 'diverging colour scheme' where the maps may be interpreted differently instead of seeing it as a continuous distribution of a network (Jones et al., 2009).

Another limitation often faced by researchers who are not familiar with the terminology and methods of space syntax is that they may find the numerical results complicated and might even misinterpret them (Can, 2012). Moreover, there is no unique method for generating axial lines from the same base map;

thus different users may generate different sets of lines for the same application (Batty & Rana, 2004).

It has been claimed that the axial analysis does not take into account building heights, street widths and metric information (Ratti, 2004); besides other limitations described by researchers. Much of the criticism evolves from the fact that the information incorporated in the axial map is not comprehensive. Ratti (2004) claims that the use of a topological support and the missing information in axial maps might possibly constitute major conceptual problems in cities. Moreover, it has been asserted that inserting more lines to define the topological data would not change the overall model (Can, 2012). Hillier and Penn (2004) oppose the previous Ratti (2004) argument and explain that according to research purposes, introducing another variable such as building heights within the spatial model can conceal the effects of spatial configuration. In addition, Hillier and Penn (2004) have explained that axial maps ignore to consider land use, because from a theoretical understanding of cities, keeping them separate is more useful to investigate "the impact of both configuration and movement on land uses and then on to the formation of centres and sub centres" (Hiller & Penn, 2004, p.506).

Although space syntax has been criticised for several limitations, some discussed above, it has helped break fresh ground in bringing together the concepts of visibility, navigation, and movement into one single element of modelling. It has opened new possibilities in examining urban areas based on the concept of space and socio-cultural aspects of the settlement (Can, 2012).

CONCLUSION

The research adopts a mixed methodology of data analysis that incorporates stakeholders' viewpoints concerning sustainable urban development in historic Cairo with space syntax analysis, aiming to propose appropriate interventions to develop this heritage site. Stakeholders' views and opinions have been collected from both interviews and questionnaires. The mixed method research model has been chosen as the preliminary method in order to form appropriate triangulation of data and ensure a comprehensive overview of the current situation in historic Cairo.

The triangulation of questionnaire and interview data analysis has provided validity to the research questions. However, a few challenges have evolved in using the mixed method approach; the need for extensive data collection, the time-consuming quantitative and qualitative data analysis, and the requirement for the researcher to probe into both research inquiries (mixed method and logical argumentation). As for the supporting logical argumentation strategy of inquiry exemplified in space syntax application, it has been used to provide an evidence-based methodology to develop spatial interventions. The proposed strategy for developing the design guidelines consists of three main stages: analysis of the current situation, level of intervention, and design guidelines for the sustainable urban development of historic Cairo. The following chapter delves in more depth into the case study of historic Cairo.

CHAPTER FOUR

ACKNOWLEDGING THE CASE OF HISTORIC CAIRO

Chapter Contents

INTRODUCTION

Heritage sites have been considered within a wide perspective that incorporates the tangible and intangible aspects of heritage (Al-Hagla, 2010). Thus, the significance of heritage sites expands beyond the value of their monuments and artefacts, to their cultural value and meaning. Historic Cairo is uniquely distinguished by its composition. Its urban heritage is composed of various historical and spatial layers from consecutive periods (UNESCO, 2012; Ibrahim & El Rashidi, 2010; Raymond, 2002; SCA, 2002; Antoniou, 1999). This model of urban heritage may be termed as 'collective heritage', which includes all spatial relationships and organic harmony and fusion of historical monuments.

However, historic Cairo has been suffering from serious problems due to rapid urban changes. This resulted in increasingly poor living conditions, lack of maintenance and infrastructure facilities, and gradual erosion of the original traditional cultural and social fabric in historic Cairo (Sedky, 2009; Fahmi & Sutton, 2003; SCA, 2002). Besides, the deficiencies of urban policies have often failed to provide a holistic approach to improve and manage this heritage site (CDC, 2008). This approach should address these problems in such a way to accommodate the needs of the local residents along with the government visions, and environmental demands. The role of stakeholders has been explored to help pinpoint several issues concerning how effective participation could be in developing heritage contexts.

The chapter aims to bring to light particular aspects of the case study of historic Cairo. It starts by outlining the significance of historic Cairo as the case choice. Then it examines the development and decline of historic Cairo's physical and social fabrics. This is followed by a chronological review of recent interventions and development projects that took place in historic Cairo, where several projects involved community participation. It critically evaluates those interventions in light of how community participation has been incorporated, and levels of success in so doing. The chapter discusses effective means for urban development of historic Cairo based on sustainable urban development principles identified.

4.1 SIGNIFICANCE OF HISTORIC CAIRO AS A CASE STUDY

> *The historic centre of Cairo bears impressive material witness to the international importance, on the political, strategic, intellectual and commercial levels, of the city during the medieval period. There are few cities in the world as rich as Cairo in old buildings: the historic centre on the eastern bank of the Nile includes no less than 600 classified monuments dating from the 7th to 20th centuries, distributed over various parts of the well-preserved urban fabric, which represent forms of human settlement that go back to the Middle Ages.* (UNESCO/CLT/WHC, 2011, p.1)

In the World Heritage Site document, the label 'Islamic Cairo' was changed to 'Historic Cairo' in 2007 (WHS, 2011). It is currently considered the fifty-fifth most visited world heritage site, amongst almost 1,000 sites worldwide (UNESCO/CLT/WHC, 2011). Historic Cairo's Islamic and Coptic heritage falls into uniquely separate parts. These parts include Old Cairo, which contains a number of important Coptic monuments; Fustat - now an archaeological area and mainly uninhabited since its demolition in 1168 AD (Antoniou, 2007; UNDP & SCA, 1997); the Citadel, the largest and best preserved fortification in the Middle East; and the south and the north east cemeteries which contain some of the most important monuments in the Islamic World (as shown in figure 4.2). Al-Muizz Street is the oldest main street of the Fatimid capital Cairo, founded in 969 AD by the first Fatimid Caliph ruling Egypt.

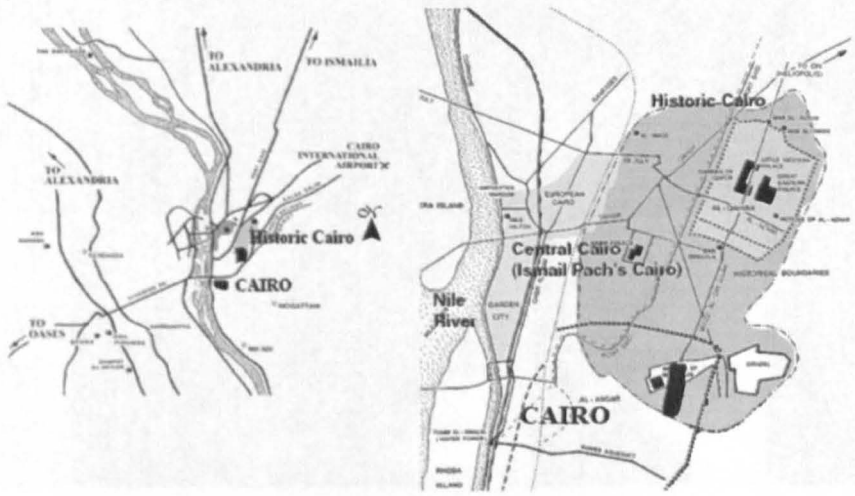


Figure 4.1 Location of historic Cairo in (left) Greater Cairo, and (right) in Central Cairo (Source: Sedky, 2009; Ouf, 2002; Sutton & Fahim, 2002)

Figure 4.2 Landmarks along historic Cairo (Source: adapted from Derakhshani, 2010)

The outstanding clusters of monuments dominating historic Cairo's townscape are considered the largest concentration of Islamic monuments in the world, both in quality and quantity. In fact some of the monuments are described as "incontestable masterpieces" (OWHC, 2011). The historic components which still survive to this day consist of separate but homogenous parts that have been built continuously over several centuries to comprise the existing open heritage museum (Grabar, 1984).

In addition, it is an enclave in the heart of the urban Greater Cairo metropolitan region (GCMR), as shown in figure 4.1, one of the largest cities in the world, with an estimated population in 2006 of about 16 million (CAPMAS, 2009). The historic centre of Cairo maintains the traditional urban fabric, and forms of human settlement that go back to the Middle Ages. It constitutes a significant material witness to the political, intellectual, and commercial development of the area during the medieval period (OWHC, 2011).

4.1.1 Conservation and Rehabilitation Initiatives in Historic Cairo

Historic Cairo has attracted numerous rehabilitation, preservation and restoration proposals, and projects, through national and international efforts. The Islamic heritage of Cairo was first introduced by the French scientific mission of the Napoleonic Expedition to Egypt (1798 to 1801). Cairo was given special attention, having developed a much more detailed map with all individual historical buildings listed and documented. Francois Jomar author of The Encyclopaedia "Description de l'Égypte" in 1809-1829, asserted that this encyclopaedic survey of Cairo was then considered an important form of large-scale conservation (Hampikian, 2007; SCA, 2002).

A programme was then developed by the Comité de Conservation des Monuments de l'Arabe, in 1882, setting a strategy of actions for safeguarding the Islamic and Coptic heritage of Cairo and was considered the greatest attempt at rescuing historic Cairo. The programme included registering the historic buildings as monuments, monuments rescued from urban invasions, restoring the damaged structures, documenting details of historic buildings, as well as establishing dialogue between stakeholders involved in historic Cairo.

Notably, another major conservation intervention in 1950 listed 622 Islamic

monuments which resulted in UNESCO designating historic Cairo as a world heritage site in 1979 (Jokilehto, 2011; Abu-Lughod, 2007; Siravo, 2001; UNDP & SCA, 1997). In 1980, UNESCO developed a plan for Old Cairo, which included historic Cairo with other districts. This plan aimed to provide a framework for the conservation of the endangered and deteriorating monuments (Sutton & Fahim, 2002). It included a proposal for better traffic management, restoration of old buildings and rationalising land ownership. Although this 1980 plan remained as a blueprint, it formed a base for subsequent development projects (SCA, 2002; Abdel-Fattah & Abdelhalim, 1984).

Following this, a collaborative research project between the General Organisation for Physical Planning (GOPP) and Institut d'Aménagement et d'Urbanisme de la Région d'Île-de-France (IAURIF) aiming to improve the built environment in historic Cairo was implemented between 1988 and 1991. The proposed rehabilitation strategy advocated introducing new public spaces that would accentuate the monuments, besides suggesting the improvement of the street network, and introducing parking areas and community services.

Subsequently, a plan for historic Cairo was prepared in 1997 by a UNDP team which notably, included a few members of the 1980 UNESCO plan for Old Cairo team (Ouf, 2002). It has been stated that the plan aimed at a broad-based rehabilitation by incorporating two approaches. The first was to plan a tourism-based rehabilitation for the restoration and re-use of monuments with limited gentrification (Sutton & Fahim, 2002; SCA, 2002). The second approach was to implement a community-based rehabilitation intervention by empowering the local community and improving their housing, education, and health facilities. The plan suggested the consolidation of five urban zones in historic Cairo, which will be further explained in chapter six, according to location, facilities available, and target users (UNDP & SCA, 1997). However, due to improper institutional and organisational frameworks in Egyptian authorities, the UNDP plan was not put into action. It was suggested that a bottom-up framework involving NGOs and local communities was needed in the UNDP top-down strategy (Sutton & Fahim, 2002).

The Egyptian government decided to develop the potentially effective UNDP

plan that incorporated further interventions required in historic Cairo. After a two-year restoration of Al-Azhar and Al-Hussein mosques, the government's next step was a road tunnel in Al-Azhar area. This formed a partial solution for the traffic and environmental pollution problems in the area. It also helped transform the Al-Azhar and Al-Hussein mosque areas into an open space directly linking to Al-Muizz Street heritage corridor, which was subsequently pedestrianised. However, due to the lack of consultation and overlooking the involvement of the local people in these projects, the people expressed dissatisfaction with the consequences of the implementation of the Al-Azhar tunnel and the pedestrianisation of Al-Muizz Street (SCA, 2002). Shop owners reported that the physical intervention was not helping to improve the commercial activities due to the significant reduction of vehicular flow in the area. Community members also reported the lack of educational, medical, and recreational facilities, besides the significant deficiency in housing units (Sutton & Fahim, 2002).

Notably, in 2005 the Program for Supporting Historical Cities at the Aga Khan Trust for Culture (AKTC), which has been discussed in chapter two, developed a significant program for the conservation and rehabilitation of historic Cairo. The program aimed to develop the framework of urban, cultural, social, and historical conservation aspects of the area in partnership with private institutions, funding bodies, and NGOs (Abada, 2008). Besides, the funding programme of Aga Khan for Micro-Credit (AKAM) provided 75% grant and 25% loan and helped rehabilitate 120 residential buildings over the a period of five years (CDC, 2008). It also intended to enhance community services; such as health, education, solid waste management, and unemployment in this deprived area.

Although there had been little role for local communities in the previous urban rehabilitation programmes undertaken by governmental and professional agencies, various forms of community-led initiatives took place in the AKTC project combining community aspirations with rehabilitation and restoration initiatives (Rashed, 2012a; Antoniou, 2007; UNDP & SCA, 1997). In a subsequent phase of the same project, surveys, meetings, and focus groups have been carried out with residents and stakeholders to identify the local

communities' anticipations from the conservation and development project. Thus, this was the first development project that incorporated community participation throughout the different stages of the project. The success of the preliminary stages of the project encouraged other local and international organisations to provide funding for consecutive stages of the project. This project then became a model for other conservation initiatives where community participation had been effectively incorporated (Abada, 2008).

Between 2004 and 2008, more funds had been invested in socioeconomic rehabilitation in Al-Darb Al-Ahmar (ADAA), as well as for housing projects and monument restorations. Those initiatives have been funded by the Egyptian-Swiss Development Fund, Ford Foundation, the World Monuments Fund and AKTC (Morbidoni & Allegretti, 2010). In 2009, ADAA Community Development Company (CDC) and the Social Fund for Development (SFD) initiated the rehabilitation of 200 houses in three action areas within ADAA district. The major conservation and development interventions in historic Cairo are highlighted in table 4.1.

Table 4. 1 Chronological review of major conservation and development interventions in historic Cairo. (Source: adapted from (Rashed, 2012a; Kondolf et al., 2011; Morbidoni & Allegretti, 2010; Abada, 2008; Sutton & Fahim, 2002; SCA, 2002; Salama, 2000)

Date	Conservation/ Development interventions & events	Responsible Organisations
1800	Detailed map published of Cairo	Napoleon's Expedition surveyors(Francois Jomar, encyclopaedia Description of Egypt)
1882	Safeguarding the Islamic and Coptic heritage of Cairo	Comité de Conservation des Monuments de l'Art Arabe
1950	List of 622 'Islamic' monuments drawn up	
1977	Association for the Urban Development of Islamic Cairo set up	
1979	Old Cairo designated a World Heritage Site	UNESCO
1980	Conservation of the Old City of Cairo	UNESCO
1984	Rehabilitation and Upgrading of Historic Cairo	Arab Bureau of Design and Technical consultations (ABDC)
1988	Greater Cairo Region Master Plan-included Old Cairo as part of Homogeneous Sector No. 1	
1988	Plans for rehabilitation of Sayeda Zeinab Quarter, Gamaliya Quarter and Al-Darb Al-Asfar Quarter	GOPP/IAURIF

Date	Conservation/ Development interventions & events	Responsible Organisations
1996	Agenda for revitalization,: Conservation and Development Proposals for Historic Districts of Old Cairo	AKTC
1997	Rehabilitation of historic Cairo	UNDP & SCA
2001	President decree 37/2001 for establishing National Organisation for Urban Harmony (NOUH)	MOC
	Al-Azhar road tunnel constructed	National Authority for Tunnels (NAT), MOT
2002	International Symposium on the Restoration and conservation of historic Cairo (Al-Azhar restoration scheme), 16-20 February	HCSDC, AKDN, ARCE, SCA , MOC, UNESCO, ICOMOS, ICCROM,
2003	80 monuments restored in historic Cairo	SCA
2005	Al-Azhar Park opens to public	HCSP, AKTC
	Al-Darb Al-Ahmar (ADAA) Housing Rehabilitation Programme (HRP)	ADAA CDC, SFD
	AKTC development of three Action Areas (Aslam neighbourhood, Bab-Al-Wazir area, ADAA street)	AKTC
2007	Guidelines for Historic Areas acknowledge HRP as best practice on the national level	NOUH
2008	New ratified Conservation Plan for ADAA	Cairo Governorate
	Pedestrianisation of Al-Muizz Street	CSA & MOC
2009	Rehabilitation of 200 houses in three Action Areas (13% of total houses in the three areas)	ADAA Community Development Company, AKAM, SFD

The following sections discuss the gradual increase in physical and social problems of historic Cairo. Overlapping responsibilities and conflicts in the administration and management of the historic city are also outlined.

4.2 DEVELOPMENT AND DECLINE OF HISTORIC CAIRO'S PHYSICAL AND SOCIAL FABRICS

4.2.1 Urban fabric of historic Cairo

> *Historic Cairo has a prominent physical urban character and a strong social identity. Several important monuments dominate its townscape notably from the north to the south. The Al Muizz Street -the central historical spine- brings together a remarkable collection of monuments and complexes. It has a unique architectural identity and contains the largest centre of Islamic and Coptic monuments in the world, both in quantity and in quality, and is included in the World Heritage List.* (UNDP & SCA, 1997, p.13)

Historic Cairo is the world's largest medieval urban system where traditional lifestyles are still alive in daily practice (SCA, 2002). It is considered to be a "conurbation or an amalgamation of several smaller cities that developed and

evolved over the last 1,500 years" (Ibrahim, 2001, p.186). Historic Cairo developed through a series of very different periods, and different dynasties, each leaving traces in the urban fabric (Sedky, 2009). Each subsequent dynasty built new mosques and monuments and sometimes demolished structures built by its predecessors. However, the Mamluks (1250-1517) and Ottomans (1517-1798) were the most notable dynasties that left hundreds of remarkable monuments, to form most of historic Cairo's rich heritage (Rashed, 2012a, p.548).

The Babylon Fort was developed as a Byzantine settlement to become the Coptic quarter, before the Arab leader Amr Ibn Al-As founded a new settlement, called Al-Fustat, late in the seventh century. By the ninth century, Al-Fustat expanded and merged with two other districts, known as Al-Qata'i and Al-Askar, to become an Islamic metropolis (Sedky, 2009). In the tenth century Al-Qahira (Cairo) was founded as a walled capital city for the Fatimid royal family and their officers and troops. After integration with Al-Fustat and the other districts, Al-Qahira became one of the largest cities in the medieval world. The period when the Islamic city flourished can be regarded as Cairo's classical period (Aslan, 2006).

In the 1800s, Cairo's transformation began with the French expedition importing European architecture and culture to Egypt. This Europeanised architecture was further encouraged in Cairo by the Ottoman Mohamed Ali Pasha and his descendants while traditional architecture was discouraged. (Antoniou, 2007). Traditional components of architecture had been replaced by western-style buildings causing a blurred architectural identity in Cairo. Thus, many traditional artifacts, such as turned wood windows, and craft workshops started to disappear, and ruined traditional houses were replaced with neo-classical buildings in historic quarters (Sedky, 2009).

By the end of the nineteenth century, accelerating demographic growth caused major disruptions in historic Cairo's physical urban structure (Ibrahim, 2001). Since Khedive Ismail's nineteenth-century Scheme of Cairo, no plans were introduced to extend this scheme for resolving emerging urban problems (Sedky, 2009). New buildings were imposed upon the historical settings, resulting in obvious fragmentation of the historic urban morphology and

leading to the emergence of unfavourable hybrid places (Abada, 2008). These hybrid places, created by structures that lack architectural or heritage value, placed within the context of valued monuments, initiated the decline of the sense of place and distinctiveness of historic Cairo. Due to significant social, cultural and physical changes, decayed housing stock, lack of open spaces, and seriously increasing population rate, some essence of historic Cairo's identity has gradually disappeared.

By the start of the twentieth century, land values had grown dramatically, causing great interest in the construction industry. This, in turn, affected the historic core of Cairo, where rapid population growth caused overcrowded and degraded residential facilities (AKTC, 2007). This generated the gradual physical deterioration of historic Cairo's original urban fabric. Poor accessibility of many unplanned neighbourhoods has encouraged many slum areas to develop in the historic quarters (Sedky, 2009). Moreover, the 1992 earthquake that hit Helwan greatly affected Cairo with a severe impact on a large number of monuments which became even more vulnerable than before. This raised national and international concern for the valuable medieval architecture in historic Cairo (Asdar'Ali & Martina, 2010). Since then, the urban fabric of historic Cairo has continued to decline and suffer further deterioration.

4.2.2 Social fabric of historic Cairo

Throughout Cairo's long history, it has experienced successive cycles of change in its social fabric that accompanied the growth of consecutive cities that were established within the centre of Cairo (Bianca, 2007). Historic Cairo was once the area where the middle- to upper-class population mostly lived. It has been asserted that less than two centuries ago, Al-Darb Al-Ahmar was considered to be one of the wealthiest neighbourhoods in Cairo (El Rashidi, 2007). The upper class moved from the centre to the north and north east, between the Nile and the Mokattam Hills due to the overcrowded centre. When the city of Fustat was built, the rich abandoned Fustat and moved to Al Askar, when, after a century, they moved to Al-Qata'i before finally settling in Al-Qahira (Cairo) (Ibrahim, 2001). Hence, its nineteenth- century streets were

occupied by the wealthy who by the turn of the twentieth century had begun to move to the new city along the banks of the Nile (Antoniou, 2007; Ibrahim, 2001).

This was followed by a movement of considerable momentum of a rural migrant worker population following the construction of the Aswan High Dam in 1960 that triggered massive immigration to the urban centres of Egypt (SCA, 2002; Antoniou, 1999). Notably, when the wealthier class moved out of the old flourishing centre, migrants occupied many areas of Cairo, with socioeconomic and cognitive values inconsistent with the cultural context of the old centre (Abada, 2008; Cernea, 2008). This societal segregation contributed to the class division, as the historic districts became limited to a certain class of people. Low-income working classes with little or no education became the dominant residents of the area, together with low- to middle-class families with higher education levels but similar low-income rates.

At present, historic Cairo is inhabited by descendants of the craftsmen and merchants who have made their home in the area for centuries, in addition to migrants who, to the present day, continue to move in from the countryside. Generally, many of the residents live below the poverty line and suffer poor living standards. The majority of residents in this area survive on less than the equivalent of one US dollar per person per day (Morbidoni & Allegretti, 2010).

Historic Cairo shows significant evidence of the city's cultural development as a consequence of overlapping layers of historical periods. It suffers many problems from emerging undesirable physical and social fabrics that have forced major urban activities to move out (Mohareb, 2009a). Many communities have been in a state of transformation, in response to the changing economic and social conditions in Egypt's recent history (Antoniou, 2007). However, the strong traditional social patterns of the local communities have historically created a sense of belonging to the area through working and residing within historic Cairo (UNDP & SCA, 1997).

4.3 SUSTAINABLE URBAN DESIGN PRINCIPLES IN HISTORIC CAIRO

Historic Cairo, as a centre of Greater Cairo, was included in a series of updated and modified master plans and schemes to address Greater Cairo's rapid urban growth through physical planning and urban management during the last 20 years or so (UNESCO, 2012). In addition the attention of most governments in the developing world has been focused on the problems of new settlements, built through authorised and non-authorised (slum) procedures. Most of these areas in historic Cairo grew rapidly in the absence of policies and laws leading to overcrowding, lack of infrastructure and poor-quality construction. Thus, historic Cairo's heritage had been exposed to constant degradation coupled with unprecedented demographic growth in the twentieth century (AKTC, 2007).

The government considered the housing stock in historic Cairo insignificant in terms of the scale of the housing problem (Siravo, 2001); the costs of rebuilding or refurbishing houses in historically sensitive areas were often prohibitively high and local residents generally do not have the capability to make any financial contribution (Abu-Lughod, 2007). In most developing countries, the desire for 'modernisation' by governments and top decision makers has often led them to believe that only new and modern housing is valuable. Old or traditional housing was considered of little value and was mostly demolished or ignored (Steinberg, 1996). All these reasons led to very little attention being paid to traditional housing areas. These urban heritage areas have continued to decline, with their physical, social, and economic functions disrupted (SCA, 2002; Antoniou, 1999).

The economic sustainability of heritage sites is necessary for any lasting improvements to the living conditions of citizens (Tweed & Sutherland, 2007). Many developing countries now realise that it is often counter-productive to eradicate large areas of existing old housing stock given the tremendous housing demand which exists and the financial inability of existing institutions to provide new housing at the rate needed. Instead, it is important to maintain this existing housing, even if it is currently in poor condition (Steinberg, 1996). Dealing with cultural heritage resources encompasses the recycling of the past

and renewal through the repair and reconstruction that are essential for successful development (Al-Hagla, 2010; Nasser, 2003).

The following subsections discuss some of the most obvious tribulations in historic Cairo, based on the principles of sustainable urban development proposed in previous studies (Smart Growth Network, 2011; Carmona, 2009; Clarke, 2009; EU Working Group on Urban Design for Sustainability, 2004; Rogers, 1997; URBED, 1997; Barton, 1996; Haughton & Hunter, 1994; Bentley et al., 1985). The researcher focuses on the most critical issues identified in the precedents discussed previously that, if targeted with appropriate interventions, would undoubtedly support the urban development and conservation of historic Cairo. The aspects discussed are diversity and choice, distinctiveness/sense of place, users' needs, self sufficiency/ participation and pollution reduction.

4.3.1 Diversity and choice

Diversity and choice are considered key aspects of sustainable urban design and development (Carmona et al., 2010; Bentley et al., 1985). These aspects, if considered, provide variety and freedom of choice of movement for people using buildings and spaces (Bentley et al., 1985). Besides, introducing mixed uses along streets and blocks enhance diversity and choice within an area (EU Working Group on Urban Design for Sustainability, 2004). In historic Cairo, many negative aspects affect the feasibility of ensuring diversity and choice for both local residents and visitors. These aspects include the increased domination of vehicle streets at the expense of pedestrian pathways. This, in turn, fragments the pedestrian circulation and experience, as "*walkable* streets connect buildings and activities across space" (Carmona et al., 2010, p.84).

The historic city was once dominated by its network of narrow busy, streets (called 'hara'), which used to define social entities in neighbourhoods. This network created small spaces and corners which provided bustling commercial points (Antoniou, 1999). However, with the extensive use of land, open spaces shrunk significantly, and became mostly occupied by parked vehicles. Thus, street spaces substituted for the lack of open spaces for commercial and social activities, consequently getting narrower and more congested and jeopardising

pedestrian circulation. Traffic congestion is more severe in the organically-connected streets. Besides, the poor maintenance of streets, and attempts by local residents to level surfaces using mud and debris causes further deterioration.

Another important aspect which added to diminishing elements of diversity and choice in historic Cairo is the segregation of activities taking place in historic quarters and newly planned districts. This was enforced by planning policy which concentrated services and amenities in the new districts and satellite cities much more than in the older ones (Sedky, 2009). It has been asserted that the historic city's commercial and economic activities and the urban characteristics it offers are neither integrated nor qualitatively compatible with central Cairo's requirements (Antoniou, 2007). Besides, major routes such as Al-Azhar Street divide historic Cairo into two parts (Al-Darb Al-Ahmar and Gamaliya districts), which are connected by a pedestrian overpass and the 2.6 km Al-Azhar Tunnel. This overpass facilitates the connection between the historic core and central Cairo for the majority of commuters. However, this pedestrian overpass is seen as a visual obstruction that damages the context of historical monuments in the area (Fahmi & Sutton, 2003).

4.3.2 Distinctiveness/ sense of place

> *Harmony and discord simultaneously characterise the streets of historic Cairo thanks to its main components, the poles that have paradoxically fed into each other and coexisted through time: the frozen moments of history represented by the majestic domes, minarets, sultanic inscriptions, monumental portals and the mobile world of the living fabric represented by the ever-changing non-registered buildings, the people and their daily activities around the monuments. When dealing with historic Cairo, therefore, we have to refer to these essential components.* (Hampikian, 2007, p.210)

Figure 4.3 The conserved distinctiveness of historic Cairo illustrated in Khan al Khalili bazaar, (left) in 1952 (Church, 2009), (right) in 2010 (Welbeck, 2010)

The unique character of such an historic site is related to its refined structure of settings and corresponding meanings that could only be comprehended by occupants, users, and visitors who interact with and immerse themselves in those meanings (Shehayeb & Sedky, 2002). The transmission of the meanings of the local culture of a heritage site to future generations is one of the main aims of maintaining architectural heritage. Consequently, it is important that any intervention in preserving this heritage is done cautiously as it can either contribute to or detract from the heritage value and distinctiveness of a place (Serageldin, 2004; Shehayeb & Sedky, 2002). This is apparent in the rehabilitation project of the AKTC; where the majority of residents of ADAA are emotionally attached to the area but are aware of its problems. The historic context represents their source of livelihood and constitutes their social network (Ibrahim & El Rashidi, 2010).

To retain the distinctiveness of a historic area does not mean eliminating non-physical qualities represented by activities that, in fact, complement the sense of place within the area. An example of this is the Al-Ghuri Religious Complex of historic Cairo where all the textile shops were removed from the surrounding area as a means of protecting the historic complex. This affected the overall livelihood and character of the area (Shehayeb & Sedky, 2002). Instead, it is suggested that creative use and re-use of the physical fabric in historic quarters, whilst allowing life of the community to go on with the least interruption, would help maintain the distinctiveness of a place (Steinberg, 1996).

4.3.3 Users' needs

An appreciation of human needs, as a principle of sustainable urban development, is part of the social dimension which raises important issues concerned with people's values and choices of urban development interventions in a society (Carmona et al., 2010; Tweed & Sutherland, 2007). However, designers and planners may face many challenges in trying to respond to the varying needs of different individuals in a community. While the aim of catering for users' needs within a social context should be to create

safe and accessible public spaces for all, the economic, social and ethical aspects could make this unachievable (Carmona et al., 2010; Carmona, 2009).

According to Maslow's pyramid of human needs (figure 4.4), physiological needs come first including food, warmth and survival; second comes safety and security needs; third comes affiliation needs of belonging and acceptance; fourth is the need for esteem by feeling valued by others through a person's education, status or ownership, and finally self-actualisation needs through artistic expression and fulfilment form the apex of the pyramid. However, Jackson & Marks (1999) suggest that in some instances, individuals might compromise their basic survival needs to satisfy their moral, psychological and spiritual needs, which is not very common.

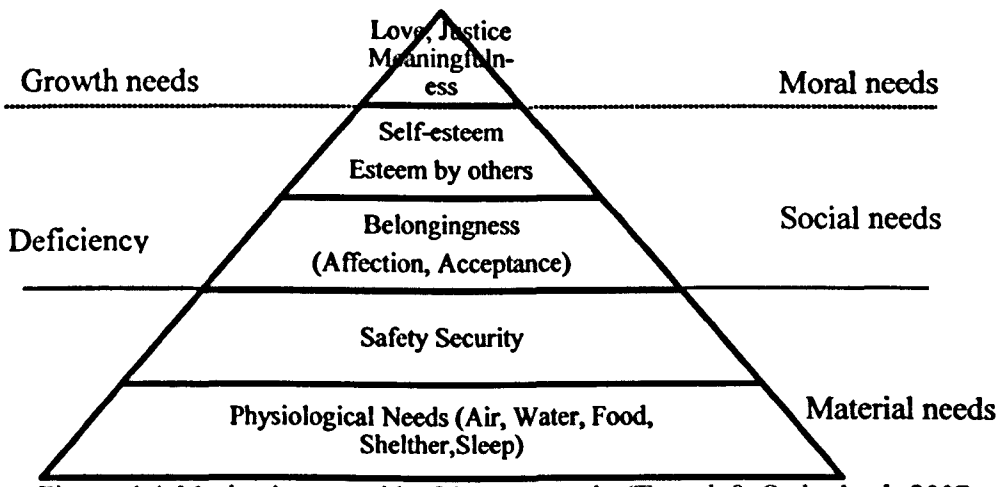


Figure 4.4 Maslow's pyramid of human needs (Tweed & Sutherland, 2007, p. 64; Jackson & Marks, 1999, p.426)

Thus, if material needs are very basically catered for, people opt for the higher levels of needs to satisfy their social and moral needs. Thus primarily, planners and developers ought to consider interventions to suit people's hierarchy of needs. This means that providing different options of tenure to cater for the socio-economic standard of an area such as historic Cairo should come first on the housing agenda. Vacant and deteriorated plots could be converted into either housing units or essential community facilities such as nurseries, schools, and health care centres, among others. Besides, facilitating loan options for low-income people is crucial, as most individuals in the local community of historic Cairo could not afford to buy housing units without any financial subsidies (Cernea, 2008).

The next level of human needs, still within material needs, is providing safety and security. Carmona et al. (2010) suggest enhancing safety by reducing pedestrian/vehicle conflict, which is one of the most obvious problems in historic Cairo. A main reason for this problem is the illegal extension of dwelling perimeters and workshop activities onto the public thoroughfares, causing pedestrians to use the main street for movement instead of the pavements which causes hazards (Shehayeb & Sedky, 2002). Also, cul-de-sacs are generally used for similar purposes, including keeping animals and drying of laundry, which further impede vehicular circulation. Another issue of security is the gradual conversion of vacant and deteriorated plots in the area into places for graffiti, drug, and crime mobs.

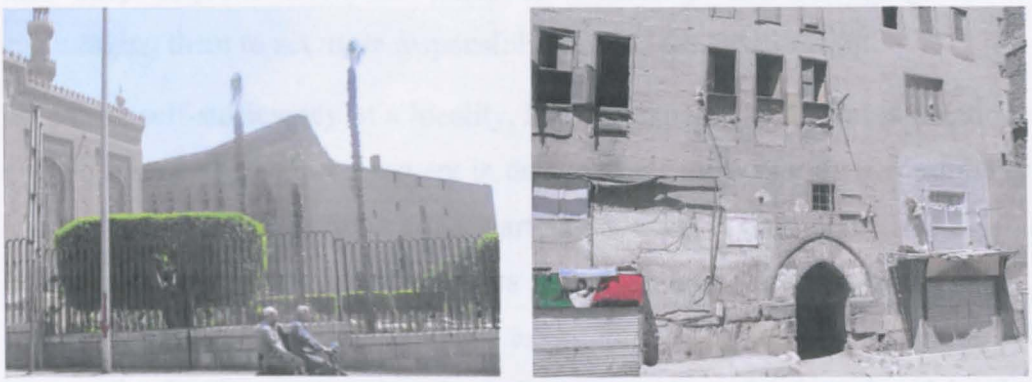


Figure 4.5 (left) Inaccessible spaces meant to serve the public, (right) Deteriorated buildings that reduce the sense of security (Source: The researcher)

There is a high percentage of unemployment in the historic area, particularly among the female population (Morbidoni & Allegretti, 2010). Notably, among the Historic Cities Programme (HCP) intervention of the AKTC, a Technical and Vocational and Educational Training Programme has been established to provide training in various traditional crafts. This has been initiated to educate craftsmen in order for them to become involved in the rehabilitation of their local area (HCP, 2007). Acknowledged and certified training programmes include construction-related crafts, such as masonry, carpentry, plumbing, and electrical engineering and also non-construction programmes such as management and computer skills. This programme helped many unemployed men and women find appropriate job opportunities in and around historic Cairo. Facilitating job opportunities and employment takes people's needs into the social needs context, besides responding to material needs as well.

4.3.4 Self sufficiency

Self sufficiency within communities requires people to be more actively involved in developing and managing their localities. International organisations try to adopt policies that consider local needs and resources. Instead of attempting to promote development through the supply of commodities, international organisations need to support local effort, thereby encouraging communities to help themselves. None of the problems in historic areas will be solved without the local people progressively taking responsibility for their immediate surroundings. Thus, an active role for local residents is crucial in terms of planning, using, conserving, and developing such areas. This may improve residents' sense of ownership and belonging; hence encouraging them to act more responsibly towards the environment.

To ensure self-sufficiency of a locality, key stakeholders and local populations need to have an active involvement in developing a vision for their community and its subsequent management (Stewart, 2000, cited in Carmona et al., 2010). However, not all community members would be engaged at the same level; thus urban development projects need to encourage people to participate in all stages of a development project in their context. A model, introduced by the Department for Environment, Food and Rural Affairs (DEFRA) in the UK and explained by the Sustainable Development Commission, is created by adopting the '4Es; Engaging, Encouraging, Enabling, and Exemplifying' (BIO Intelligence Service, 2012, p.7; SDC, 2006). The model implies that engaging the public to participate in debates, group meetings and consultations, could be encouraged by rewarding those who participate and incentivising others who do not. By providing the infrastructure for sustainable participation, enabling is thus accomplished. Finally, by exemplifying precedents of successful participation schemes, more people would be motivated to actively engage in schemes aimed to develop their locality (Sanoff, 2000; Bentley et al., 1985).

To implement the 4Es model in historic Cairo local communities, however, broad education and information campaigns need to be run in order to raise awareness before putting into practice participation programmes. An important reason for this is the relatively low education levels and low income levels

amongst the majority of historic Cairo's residents and workers (Sedky, 2009; UNDP & SCA, 1997). Raising people's awareness can be done by the NGOs. However, due to the complex regulations and limitations imposed by the government upon NGOs through Egypt's State of Emergency Law, they have a limited active role. This law restricts the activity and fundraising initiatives of NGOs to the extent that any NGO could be easily dissolved by the Ministry of Social Affairs. In Cairo, there exist a limited number of active NGOs, approximated to be around 76, which are formally registered organisations (Morbidoni & Allegretti, 2010).

Thus, the role of institutions liaising with government authorities and residents is critical. In historic Cairo, there has been evident confusion between authorities related to the monuments and institutions in the area. There has been frequent overlap of responsibilities; one of the main reasons for improper management of rehabilitation and restoration programmes (Antoniou, 1999). Currently, there are no clear policies of development or guidance for rehabilitation projects planned particularly for historic Cairo. It has been reported that in most heritage sites in Egypt, the biggest obstacle to the development of these areas lies in the division of administrative responsibilities among diverse governmental authorities (the local, tourism, archaeology, and endowments authorities) (Abada, 2008; Antoniou, 2007; Fahmi & Sutton, 2003).

Besides, the frequently changing building rules and regulations caused the waves of demolition, damage and deterioration that are currently present. Due to the absence of a national land policy, land speculation has transformed the land uses from residential to commercial, by reducing the economic benefits of its poor quality housing stock and by increasing overall land prices, all in the context of an inadequate infrastructure. Notably, about 30% of new construction in the area takes place with no valid permission (Abada, 2008). Several laws prohibit the renovation of deteriorating buildings which are adjacent to monuments, and encourage their collapse in order to create vacant buffer zones to protect those monuments. Meanwhile, other laws permit small workshops and manufacturing industries to be established within the historic area, thus causing negative impacts on adjacent monuments (Sedky, 2009;

Abada, 2008). Subsequently, this institutional disorder caused by the mismanagement of the urban area, prompts the international community to call a halt to any significant financial and technical support in historic Cairo.

4.3.5 Pollution reduction

Historic Cairo and the surrounding suburbs suffer from all sources of pollution; including noise, visual, air, solid waste and debris pollution, and a failing sewage infrastructure. These sources of pollution form a harsh set of factors that threaten both the residents and the historic monuments. Currently, the rising groundwater table in historic Cairo is considered one of the major hazards affecting the area, particularly after being polluted by the corroding sewerage system (Morbidoni & Allegretti, 2010; Sedky, 2009; SCA, 2002). The polluted groundwater level problem is compounded by the increasing pressure of the surrounding districts, thus posing a significant threat to this heritage site (Sedky, 2009; UNDP & SCA, 1997). Notably, government has focused on repairing and expanding the sewerage infrastructure in areas surrounding the main roads such as Al-Azhar and Al-Muizz Streets. However, it has not yet considered other segregated areas of the historic site, which does not guarantee the full recovery from the threat of polluted groundwater and the crude sewerage system (Sedky, 2009; Aslan, 2006).

Another pressing problem is air pollution, caused mainly by high levels of volatile aromatic hydrocarbon levels. Dangerous levels of lead, carbon dioxide and suspended particulate matter have also been recorded in Greater Cairo. The reasons for all these pollutants are mainly unregulated vehicle emissions (about 60% of vehicles in Cairo are relatively old), urban industrial practices and trash burning (Fahmi & Sutton, 2003). Also, due to the lack of rain and the prominent layout of tall buildings and narrow streets, Cairo has a very low dispersion factor which creates a basin effect (Khoder, 2007). In addition, noise pollution in this area is produced mainly from noisy metal welding, marble cutting, and car repair workshops, besides the constant traffic congestion not only in the main roads surrounding the area, but also the secondary and tertiary roads within. Thus, for sustainable urban development in historic Cairo, acting on pollution reduction is a major aspect.

4.4 DISCUSSION AND CONCLUSION

4.4.1 Problem issues of delivering sustainable development in historic Cairo

It has been suggested in a previous section of this chapter that to achieve sustainable urban development in historic Cairo, a number of factors need to be targeted strategically due to the delicate state of this area. Of those discussed are human needs and self-sufficiency. Barriers to achieving human needs and self-sufficiency, which sometimes prove quite challenging, are often caused by both individuals and institutions. Those barriers caused by individuals comprise the already established and often hard-to-change behaviour and lifestyle, people's aspirations, lack of choice, lack of skills and vision and lack of political will (Carmona, 2009; Clarke, 2009; Rogers, 1997; URBED, 1997; Barton, 1996; Haughton & Hunter, 1994; Bentley et al., 1985).

People living in historic Cairo are used to unsustainable behaviour; no recycling information or facilities, purchasing motorbikes and old cars for commuting, working in polluting and noisy crafts in the area, and many other facets of unsustainable actions. People in this area, for some reason, appear to have little or no choice in the way they live due to cultural, social, economic and physical constraints. Thus, if residents of historic Cairo aspire to unsustainable and consuming lifestyles, then in order to change or alter their aspirations, extensive communication and information campaigns to educate people are required. Moreover, there is a lack of skills and vision in both the public and private sectors concerning the importance of the monuments and development projects in the area. People are often very suspicious of development projects surveyors and experts, as they are more often faced with the threat of relocation to another area away from the source of their livelihoods.

Barriers to sustainable development of historic Cairo caused by institutions include various issues. One of the major problems is the different priorities of the government and the general public. In the case of historic Cairo, the government's priorities are to conserve the monuments and facilitate tourism in the area, while the locals' priorities are to enhance their living environment and

livelihoods. Another issue of concern is the conflicts of interest between different stakeholders. As explained previously, the variety of stakeholders in the area causes the conflicts of interest to arise and subsequently affect the development initiatives. In addition, powerful bodies such as government and developers usually overwhelm the less powerful residents and interest groups with their effect on the final decisions in development projects. Providing a thorough understanding of the political context and developing a supportive administrative framework that facilitates community involvement may minimise the effect of power disparity.

4.4.2 The role of stakeholders in sustainable development of historic Cairo

Enabling and encouraging local communities to participate actively in developing their localities is a major factor in achieving successful urban development interventions, particularly in sensitive sites such as heritage sites (ICOMOS, 1999a, Article 12). However, the success of community participation in sustainable development of historic Cairo depends upon the identification of the diverse stakeholder groups involved in the area. This requires defining their perceptions, needs, and aspirations and managing the different and sometimes conflicting interests through an appropriate conflict analysis initiative (Yung & Chan, 2011).

One of the best practice schemes in Al-Darb Al-Ahmar Revitalisation Project in 2005 has been the Housing Rehabilitation Programme (HRP), funded by AKTC. The scheme claimed that partnerships and capacity building have been paramount to successful rehabilitation and have helped the programme achieve bold targets within a constrained time line (Morbidoni & Allegretti, 2010; UN-Habitat, 2008). This was done by creating a matrix of relationships targeting different stakeholders aiming to sustain the rehabilitation process. In this matrix, vertical partnerships have been formed between community members, organisations and local authorities. Horizontal partnerships have been formed first at the government level, second between community organisations, and third between community members. This outcome was mainly because stakeholders were required to contribute financially to the project. On the other hand, although another relatively successful project, the UNDP Rehabilitation

of Historic Cairo in 1997 was supported by the Egyptian government; many complaints were received from the local community for not involving them in any of the project stages and being left out from the benefits of the project.

Thus, clear and strategic operational guidelines for rehabilitation need to be established so that conservation of historic buildings is guaranteed and people's needs are responded to. Table 4.2 identifies the different stakeholders in historic Cairo, their influences in development interventions and the effect of their involvement on long-term social, economic, physical and environmental sustainability.

Table 4. 2 Main stakeholders in historic Cairo, their influences and outcomes of major intervention projects (Source: adapted from Gharib, 2010; AKTC, 2005b; Fahmi & Sutton, 2003)

Stakeholders in historic Cairo			Influences	Outcomes of major interventions	Long term effects
Primary Stakeholders					
Community and societal organisations	**Local Communities**	**Low income residents (tenants)** **Middle income residents (owners)** **Wholesale merchants, retail shop owners and stall holders** **Labourers** **Commuters** **Local Cairene visitors** **Members of Parliament** **Public figures** **Retail shop owner**	Support and participate in developments which have direct impact on the local community i.e. housing rehabilitation and local services. Enhance tourism facilities and increase public awareness of heritage areas among their community.	**AKTC** Improving job opportunities Improving public facilities Working with the community as a main partner (bottom-up strategy) Improving the quality of life Eradicating poverty **UNDP & SCA 1997** Informing the community only about the official future plan (top-down strategy) Improving the quality of life Creating employment opportunities	Provide financial support Provide inclusive public space Greater civic pride (sense of Community) Reinforced sense of place Increase accessibility inside heritage area Enhance awareness of heritage protection Threat of gentrification from the heritage site
	Practitioners	**Conservation professionals** **Experts/ consultants** **Practitioners** **Artists**	Comprehend priorities and coordinate the massive and gradual interventions in historic Cairo	**AKTC** Involving practitioners and experts in decision-making Developing creditable comments and feedback **UNDP & SCA 1997** Engaging experts in the decision-making process.	Control over funds and planning aims. Political recognition Technical achievement Expanding successful projects into nearby areas

Stakeholders in historic Cairo			Influences	Outcomes of major interventions	Long term effects
	NGOs	**Association for the Urban Development of Islamic Cairo(AUDIC)** **Fatimid Cairo Development Agency** **Asala, Darb Al-Ahmar** **Friends of Environment Development Association** **Sustainable Development Association for Gamaliya**	Pursue necessary activities for the community i.e. social development, safeguarding culture Focusing on social development, and physical upgrading	**AKTC** Engaging NGOs in funding grants and monitoring of rehabilitation projects. Supporting technical training and appliances provision within community facilities. Involving NGOs as independent decision makers. **UNDP & SCA 1997** Involving NGOs in decision-making processes Raising NGOs' heritage awareness Developing credible programmes with NGOs	Improve security and prevent crimes Increase cultural awareness Encourage involvement of NGOs Effective use of resources and improved environmental consideration Networking and cooperating with local community
Secondary Stakeholders					
Developers and Investors	Egyptian and Foreign banks	**Social Fund for Development, Egypt** **Nasser Social bank** **Islamic Development Bank** **African Development Bank**	Promotion of rapid economic growth and poverty reduction. Foster the economic development and social progress within communities	**AKTC:** Engaging funding bodies in providing grants to support the housing rehabilitation projects with low interest rate. **HCSDC 2002** Promoting funding bodies to support artefacts and crafts Restoration of three historic houses and improving surrounding areas. **UNDP & SCA 1997** Engaging funding bodies in infrastructure projects Encouraging private sector to invest in historic Cairo (hotels, cultural centres, etc)	Increase confidence between private developers and local authorities Enhance initial investment in tourism sectors Reduce national tax revenue to encourage investment in heritage sites Designate benefits for unemployment
	Real Estate Investors	**Al Ismaelia for Real Estate Company**	Preservation of the historic character of the buildings (Khedivial and historic Cairo)		
	Private Sector Investors	**N.A.D.I.M. Center (Dr. Asaad Nadim)** **French and Syrian entrepreneurs (Veronique Sedro and Youssef Takla) owner of Le Riad Hotel de Charme, Al Muizz Street**	Preservation and restoration of four historical monuments The efforts depend only on the profit without taking on consideration the social needs of the community		

Stakeholders in historic Cairo			Influences	Outcomes of major interventions	Long term effects
International Aid Organisations	International	**United Nations Development Program** **German Society for Technical Cooperation** **United States Agency for International Development** **United Nations Educational, Scientific and Cultural Organization** **Canadian International Development Agency** **United Nations Human Settlements Programme**	Reducing poverty, promoting sustainable development. Encourage social and infrastructure developments Provide vocational training Restore historic and significant monuments Evaluation and monitoring of development funded projects.	**AKTC:** Revising the previous interventions schemes to fill the gap between deficiencies of these projects and stakeholders needs Facilitating the residents with access to housing grants and affordable loans from other international Aid Organisations. **UNDP & SCA 1997** Promoting higher conservation standards through advice, training, and monitoring of construction activities. **UNESCO 1980** Starting point of involving international organisations (UN organisation) in development interventions	Revitalising the intangible traditional artifacts (stucco windows, turned wood, and inlaid marble) Abolish illiteracy. Increase chance for girls to continue their education, and access to better nutrition Increase awareness among residents of the importance of their heritage site. Improve government institutional learning Networking and cooperating with local community
	Regional	**Aga Khan Trust for Culture (AKTC)** **Agha Khan for Cultural Services-Egypt (AKCS-E)** **Egyptian-Swiss Development Fund** **Arab Association for Social Development**	Focuses on the physical, social, cultural and economic revitalisation of communities in the Muslim and Arab world		
Official Local Administrative Organisations	Ministries	**Ministry of Awqaf (religious endowment)** **Ministry of Housing, Utilities and Urban Development** **Ministry of Culture** **Ministry of Tourism**	Provision of infrastructure, housing projects, security of monuments ,	**AKTC** ADAA Housing Rehabilitation Project announced best practice on a national level. SCA and CG modified their conservation schemes following this project to promote a better rehabilitation process. Encourage SCA to change its policies regarding the massive demolition of housing in historic Cairo. **HCSDC 2002** UNESCO seeking to strengthen coordination among various institutions involved in the rehabilitation plans World Heritage Committee encouraged the local authorities to elaborate a comprehensive institutional framework to ensure improved management of the area	Planning, design and implementation Provide financial support through annual national budget plan designed by Ministry of Finance Reduce public expenditure Increase economic viability for development opportunities Reduce overlapping of responsibilities Eradicate slum and environmentally degraded areas
	Specialised Organisation	**Supreme Council of Antiques** **National Organization for Urban Harmony** **Historic Cairo Restoration Project (HCRP)**	Charge of security of monuments and archaeological sites Improving the visual image of historic areas Restore and renovate historic Medieval Islamic Cairo		
	Governorate / Local Authorities	**Cairo Governorate** **Downtown Cairo Local Authority (Wust District)**	Public and administrative services		

Stakeholders in historic Cairo	Influences	Outcomes of major interventions	Long term effects
		UNDP & SCA 1997 UNDP with the assistance of SCA implemented the project of rehabilitation of historic Cairo	

Due to the unique character of the living heritage in historic Cairo, sustainable urban development principles need be strategically planned in both the short and long-term. The study examines five particularly significant principles which have been incorporated in the proposed design intervention. Those are diversity and choice; distinctiveness; users' needs; self-sufficiency; and pollution reduction.

A strategic plan should be planned and put to action for the management of the historic area along with a future overview (at least a five-year plan) to emphasise the emotional, cultural, social, and economic values inherent in the heritage context. Such values shall be defined in terms of priorities since the mission of the heritage site has to be respected and maintained. The sources of finance should also be specified, given the fact that the process of planning, programme preparation, and budgeting is an integrated operation that has to be continually revised in order to be compatible with the plan and manner of implementation. Furthermore, the maintenance programmes and the duties and responsibilities of the maintenance body need to be clarified. The historic area management plan should include management procedures and systems and identification of the responsibilities to avoid collective supervision - as is the case now in historic Cairo - to avoid conflict of decisions and streamline the process of decision making. The following chapter will describe and illustrate the survey findings and interpret those through correlations and further statistical analysis of the results.

CHAPTER FIVE

FIELD WORK SURVEY ANALYSIS IN HISTORIC CAIRO

Chapter Contents

INTRODUCTION

The aim of this field work survey is to understand historic Cairo based on the views, values, behaviour, and attitudes of its stakeholders. It also aims to evaluate the current circumstances of the social and urban contexts of historic Cairo to facilitate successful upgrade and development of this historical area. Regrettably, most of the previous development projects and interventions have focused solely on physical problems, without considering the aspirations or needs of the area's stakeholders. Thus, the survey designed for this research will map the personal constructs of a sample of stakeholders within historic Cairo; aiming to explore the gaps between their expectations/aspirations and those of decision makers. It seeks to engage stakeholders in defining the potentialities and constraints of historic Cairo, and to involve them in the design guidelines proposal for their context; seeking to improve their living conditions. Data collected from 180 successfully filled questionnaire forms was analysed and discussed.

One of the most significant correlations has evolved between residents' satisfaction and sense of place, perceptions of walking in historic Cairo, participation, and attitudes towards spatial network. Other remarkable correlations have also appeared between intention to participate and the need for improving spatial structure, sense of community, positive attitude towards historic Cairo, and awareness of cultural heritage. This chapter starts by illustrating general survey findings, and delves into interpretation through correlations and further statistical analysis to map out the community views and aspirations regarding the urban development of their historic context.

5.1 GENERAL SURVEY FINDINGS

5.1.1 Residents' socio-economic characteristics

This section contains the results of questions 1-10 (Appendix C) about the respondents' socio-economic position, their origins, employment, and means of transport. Most of the households in historic Cairo - 87.3% - work and live or live only in the area. The distribution of the population among different age groups is affected by factors such as fertility, mortality, and immigration. From

the sample, 35.6% of the respondents are under 20 years (between 16 to 20 years), 18.2% between 20 and 29, and 21.2% between 30 and 44 years of age. The total percentage of those less than 30 years of age, 53.8%, illustrates that the youth can have a major role in their communities. This could be, in effect, by involving them in the planning of development projects, and encouraging an active and voluntary attitude. Dr. Adli Bishay, from FEDA, when interviewed asserted that the youth would gain a lot of confidence by realising that their opinions and views of their area are valued and could directly contribute to a positive change in their community. Among the households sampled, the gender breakdown is 43.9% male and 56.1% female, which actually reflects the overall gender breakdown of historic Cairo.

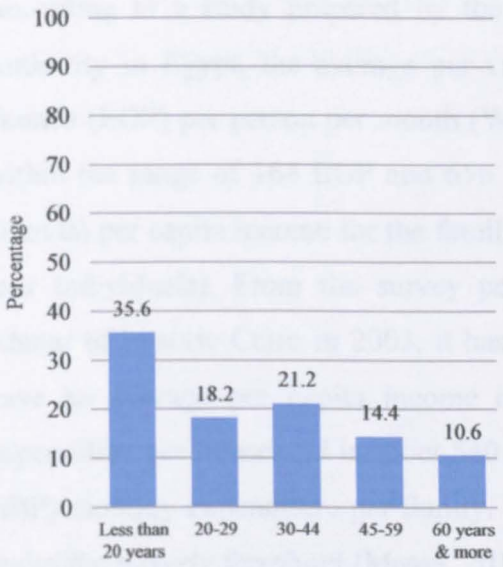


Figure 5.1 Age group of the respondent

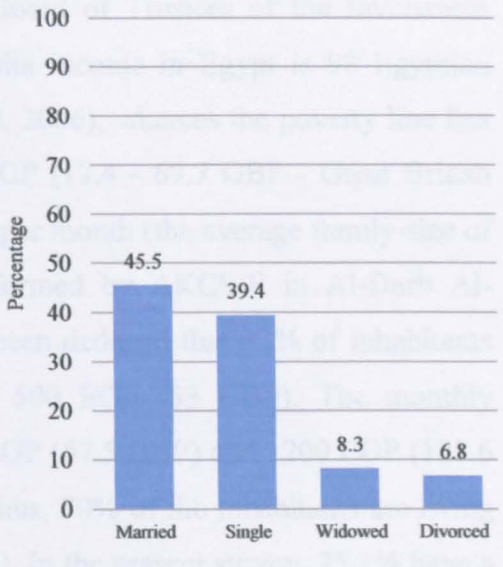


Figure 5.2 Martial status of the respondent

As for the marital status, from figure 5.2 45.5% of the sample is married, 39.4% of those surveyed are not/ have not been married. One of the reasons for their not being married is the lack of housing units in and around the area of their original residence, in spite of the available vacant plots 6.1% (CAPMAS, 2009) and unoccupied residential units 14.5% (WB, 2006, p.33) within historic Cairo. This last figure is suggestive of the potential for the development of historic Cairo to become a better place for them to live in, as most of these individuals hope to marry and settle in new households.

The labour force is defined as including all people that contribute with physical or mental efforts to the production of goods or services (in other words, those who are employed), as well as those who are capable of working and are searching for a job but have not found one yet (the unemployed) (CAPMAS, 2009). The survey shows that 89.4% of the population of historic Cairo is in the labour force. Of those who are employed, 64.1% have permanent jobs, while the remaining 35.9% have intermittent, temporary, or seasonal jobs. Of those who are living in historic Cairo, the majority, 70% have been residents in the area for more than 20 years. This confirms that the sampled respondents in the survey should have the ability to define the problems and opportunities in historic Cairo.

According to a study prepared by the Board of Trustees of the Investment Authority in Egypt, the average per capita income in Egypt is 98 Egyptian Pounds (EGP) per person per month (WB, 2006), whereas the poverty line lies within the range of 164 EGP and 656 EGP (17.4 - 69.7 GBP - Great British Pounds) per capita income for the family per month (the average family size of four individuals). From the survey performed by AKCS-E in Al-Darb Al-Ahmar of historic Cairo in 2003, it has been deduced that 32% of inhabitants have an average per capita income of 500 EGP (53 GBP). The monthly expenditure per household is about 540 EGP (57.5 GBP) and 1200 EGP (127.6 GBP) monthly expenditure per family. Thus, 70% of the inhabitants are living under the poverty threshold (Massa, 2011). In the present survey, 75.1% have a fixed income, 15.9% an irregular income (temporary, occasionally), and 9% no income. It should be noted that the irregular income may be part of another income from commercial or tourist activities. Respondents described the heritage city as an expensive place for living because of its touristic nature. In most cases, the person representing the household is the main source of income for the family. It has been suggested by Mrs Nawal El-Messiri, N.A.D.I.M. Center, when interviewed that the minimum wage should be raised to reach at least 1200 EGP (127.6 GBP) to fill the gap between income and expenditure and to mitigate corruption and bribery.

In addition, the Human Development Index (HDI) produced by the UNDP, is a composite indicator of average standards of living which reflects a mix of life

expectancy, educational attainment, and income per capita levels. It shows that, while Egypt is ranked 112 of 186 countries in 2012 in standards of living, there has been a slow but steady improvement over the last two decades. One of the most important issues that would improve people's living conditions is to improve services, particularly educational and health services, and awareness programmes and services.

5.1.2 Housing conditions and surrounding environment

There are five tenure types dominating the housing stock in historic Cairo (as shown in figure 5.3: rental according to the 'old law' - 59.3%, and ownership - 20.3%. Rental according to the 'new law' is still limited, at 15.3%, and gift and furnished rents are 5.1%. The 'new law' rent refers to Law no. 4 of 1996 that has decontrolled rents and allowed landlords to set market prices for new or vacant units.

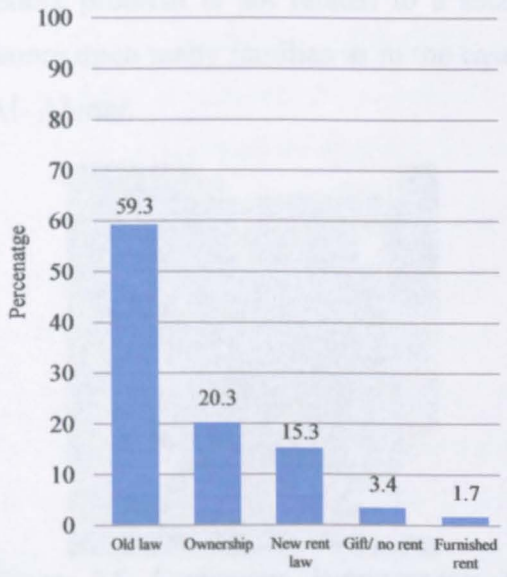


Figure 5.3 Tenure status and security

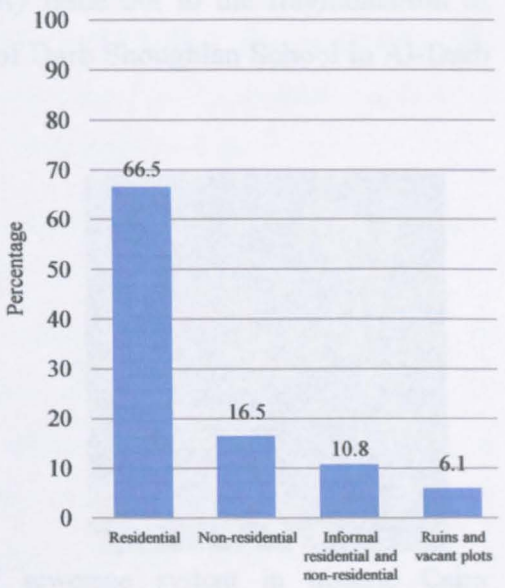


Figure 5.4 Land plot categories in historic Cairo (UNDP & SCA, 1997)

The purpose of the old rent control rules was originally intended as a measure to enable low- and middle-income tenants to better afford their housing rentals. However, the controls in Egypt did not attain this goal and in fact brought about the opposite situation (McCall, 1988). As a result of these rules, absent landlords do not maintain their rented houses. In turn, residents - due to their

low income and poor status - are more concerned with their livelihood and less with the deterioration of their residential properties.

Away from the heritage corridor, and along the historic wall to the west, the area's decline is apparent where a combination of threatening conditions is observable. This area is characterised by a decaying housing stock, a lack of public spaces, and increased population densities. According to UNDP & SCA (1997), there are high percentages of ruins, vacant plots, and informal buildings (16.9%) (as shown in figure 5.4). Some available residential and vacant land plots have been occupied by rural immigrants and their poor and insecure tenure contributes to overcrowding and squatting (Bianca, 2007).

According to the UNDP housing study, historic Cairo contains 300,000 housing units, almost 10% of these units are with no security of tenure (UNDP & SCA, 1997). However, the National Organisation for Urban Harmony in Egypt (NOUH) and the Aga Khan Trust for Culture (AKTC) have discussed that the tenure problem is not related to a security issue but to the fragmentation of tenure upon many families as in the case of Darb Shoughlan School in Al-Darb Al- Ahmar.

Figure 5.5 Continuous improvements of sewerage system in historic Cairo (Left).Vacant and ruined plots in Al-Darb Al-Ahmar neighbourhood (Right)

Most of these areas in historic Cairo have grown rapidly in the absence of policies and laws, leading to overcrowding, lack of infrastructure, poor-quality construction, and bad site conditions. Also, the costs to rebuild or refurbish houses in historically sensitive areas are often absurdly high and local residents rarely do have the ability for any financial contribution (AKTC, 2007; Siravo, 2001).

The obsolete constraints of the planning policies and unclear property ownerships discourage potential developments. Meanwhile, unrestricted changes are allowed in other areas in Cairo. The cumulative effect of these trends has impeded a balanced management of the area's physical resources.

The water supply network in historic Cairo is similar to other parts of Greater Cairo and is generally acceptable for all domestic uses. However, roof water tanks used in many parts in the area are improperly maintained, leading to the provision of contaminated water. In addition, all of the houses are connected to the electric supply unless they are illegally occupied. Earlier studies (UNESCO, 2012, p.94; AKTC, 2007; Bianca, 2007; SCA, 2002; UNDP & SCA, 1997) have reported that the sewerage system in historic Cairo is inadequate. However, field visits and in-depth interviews indicate that there have been recent improvements in many parts of the area. In his interview, Prof. Abbas El-Zafarany, NOUH, indicated that around 60% of the infrastructure in historic Cairo has been improved but the need still exists for major development of the infrastructure systems, particularly sewage networks. He suggested the government is required to implement a short term plan for gradual upgrade of the sewage infrastructure supported by the local communities.

With regards to the quality of housing conditions, which is generally getting worse, the majority of respondents 72.7% complain of the problem of overcrowded households, as indicated in figure 5.6 below. Their opinions are focused on household overcrowding as there are not enough rooms or space for the number of people who live in them. Many families of five or six live in undersized single rooms. This is a very common trend of the increased densification in historic Cairo over time and a parallel phenomenon of serious overcrowding. When interviewed, Prof. Sohair Hawas, NOUH, affirmed that as families grow, it becomes more and more difficult for newly formed families to afford new units; thus rental rates soar and overcrowding increases. In addition, due to fragmented ownership and little owner occupation; and also the old rent control acts as a disincentive for landlords to maintain or improve residential property.

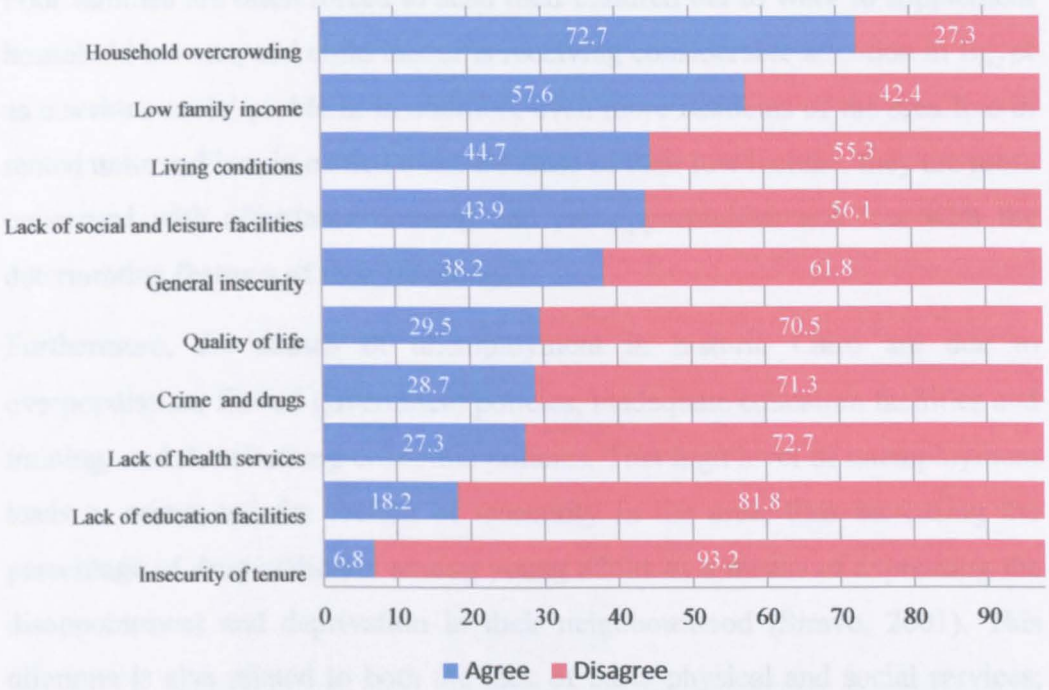


Figure 5.6 Most tangible problems inside historic Cairo according to individual prospect

This can be resolved by the Central Government in collaboration with the Cairo Governorate to establish a subsidised housing scheme to provide affordable housing for people in new communities to those who cannot manage to pay for new house rent. A percentage of monthly income could be paid for rent and the rest of the rent could be subsidised by the government or a private organisation. Also, the government should relocate residents of houses that are in poor conditions to alternative accommodation before planning to demolish those housing units. The government should also regulate the relationship between landlords and tenants by modifying the old rent law according to the current conditions. Determining the responsibilities of repair and maintenance is required as well, in order to ensure safety and preserve buildings in good conditions. It is important to utilise deteriorated housing units, even if currently they are in poor condition (Steinberg, 1996). The rationale of housing upgrade is not just to create better living conditions for the residents, but also to contribute to the rehabilitation of the immediate context, building on the integrity of the historic area and adding to its aesthetic value.

Moreover, (as shown in figure 5.6), 57.6% of the respondents complain about low family income that leads to the deteriorating quality of life and well-being.

Poor families are often forced to send their children out to work to supplement household income, and child labour is receiving considerable attention in Egypt as a serious social problem. In addition, even more residents of the area live in rented units and less in owned ones. Because of their low income, they are more concerned with affordable housing and job opportunities and less with the deteriorating features of their dwellings.

Furthermore, the causes of unemployment in historic Cairo are due to overpopulation, flawed government policies, inadequate education facilities and training, and deteriorating economic policies. This high level of unemployment leads to crime and the feeling of insecurity in the area, thus increasing the percentage of drug addiction among young adults as a means of expressing the disappointment and deprivation in their neighbourhood (Siravo, 2001). This dilemma is also related to both the lack of basic physical and social services; such as potable water, sanitary facilities, solid waste collection, and public spaces and community services. Prof. Abbas El-Zafarany suggested in the interview establishing a campaign to include community members that monitors and controls solid waste collection where penalties could be imposed on residents and shop owners who do not follow the rules.

5.1.3 The residents' perceptions towards the area

The findings of this part of the questionnaire are a major focus in this study. They reflect the opinions and perceptions of the residents in historic Cairo. It includes questions 14-25, which are a combination of closed and open-ended questions. However, the attitudes of the local people who live and work in historic Cairo city towards the heritage around them is a more difficult and complex matter to assess. To some, it is an outdated urban fabric, but to others it is a precious and significant heritage context. The following sub-sections provide further analysis on stakeholders' views and attitudes towards a number of aspects in historic Cairo.

5.1.3.1 Potentialities of historic Cairo

As the research is concerned with the future development of historic Cairo, it seeks to identify the potentialities in this district. According to satisfaction with the historic heritage (figure 5.7), 62.9% of respondents (very satisfied and

satisfied) express their contentment with historic Cairo for different reasons. The distinctiveness and sense of place of the area, its traditional character and historical monuments have shaped the community's identity and continuity, and the central location of historic Cairo with regards to Greater Cairo are some of those reasons. However, 32.6% of respondents (very dissatisfied and dissatisfied) have expressed their preference to change their area of residence due to the lack of permanent provision of potable water, traffic congestion, few pedestrian routes amongst other problems.

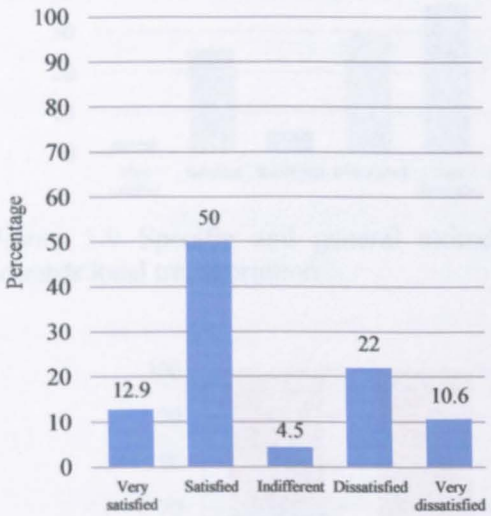


Figure 5.7 General experience/opinions of historic Cairo

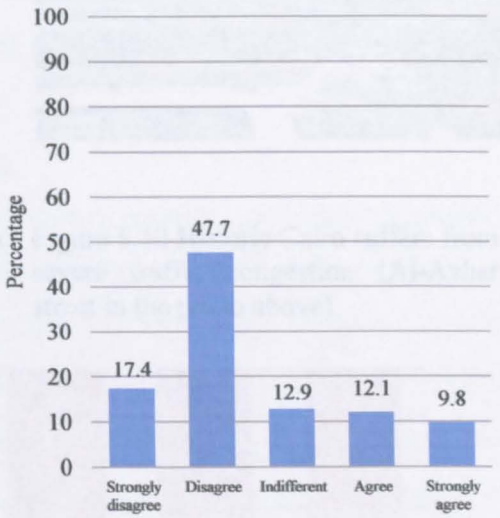


Figure 5.8 Historic Cairo is known as being a slum area

Furthermore, figure 5.8 illustrates that 65.1% (strongly disagree and disagree) of respondents do not consider historic Cairo as a slum or unplanned area. This indicates that residents are generally satisfied with their context but believe it requires some upgrading. Some of the respondents believe that this heritage site should reflect its authentic image, in terms of housing, urban character and cultural identity, and that the character and style of new construction and development should be controlled.

Figure 5.9 below shows that 65.9% of the respondents (very dissatisfied and dissatisfied) are not satisfied with the existing transportation system in historic Cairo. Most network links and intersections in the area suffer from severe traffic congestion during peak hours, due to high densities in the organic layout system, where roads and sidewalks are used for commercial activities. Historic Cairo jostles for accessibility with other areas of Greater Cairo (GC). This

results in the occupants and visitors suffering from commuting and parking deficiencies. It should be easily linked with GC in terms of improving commuting connections and providing better transit.

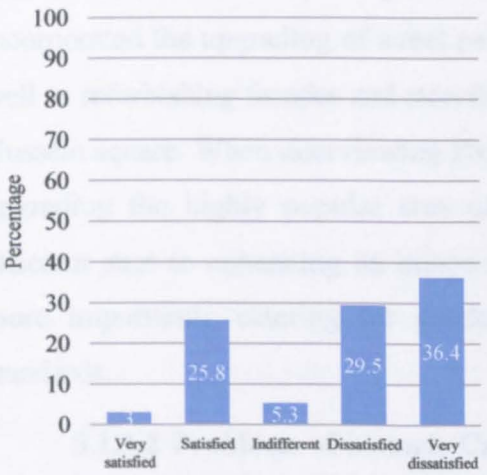


Figure 5.9 Specific and general attitudes towards local transportation

Figure 5.10 Historic Cairo suffers from severe traffic congestion (Al-Azhar street in the photo above)

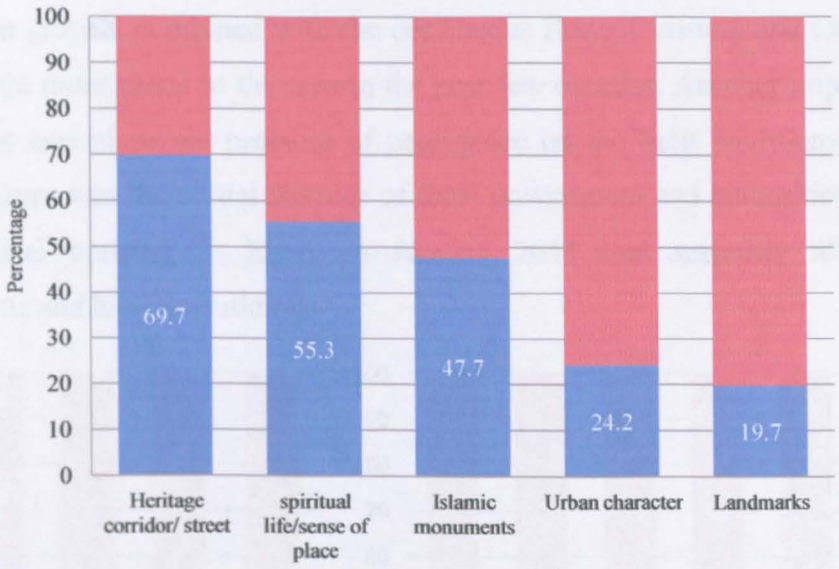


Figure 5.11 Significance in historic Cairo (Blue for agree and red for disagree)

In spite of the problems and deficiencies that are deeply rooted within this unique area, a number of potentialities may be regarded as a core for development. The heritage corridor (69.7%) and sense of place (55.3%) are considered two of the major potentialities in historic Cairo (as shown in figure 5.11). Also, 47.7% regard the Islamic monuments that dominate its townscape; notably from north to south, the Al-Hakim mosque, the Al-Azhar heritage corridor, and the Sultan Hassan square as another potentiality.

Furthermore, in Al-Muizz Street, the traditional layout of residential blocks, open spaces, commercial nodes, mosques, and places of social gathering is integrated to create a highly cohesive urban environment. This has been established since 2007 by the government's developmental actions, which has incorporated the upgrading of street pavement, public facilities, and signage, as well as refurbishing facades and storefronts within the main touristic area of Al-Hussein square. When interviewing Prof. Saleh Lamei, CIAH, he suggested that upgrading the highly popular area of historic Cairo may be considered an efficient start to enhancing its image thus attracting visitors and tourists, and more importantly catering for residents' needs and upgrading their living standards.

5.1.3.2 Problems of historic Cairo

It has been stated that although historic Cairo contains the largest remaining remnants of any Middle Eastern medieval-styled city, it is dwarfed by the huge urban agglomeration that currently surrounds it on all sides. Furthermore, the population growth, combined with the continuous flow of visitors and tourists, has brought more chaos to the area in the past few decades. Another important factor that caused severe pressure of negligence on the built environment of historic Cairo was the partial absence of local government and authorities after the political uprising in Egypt in January 2011 that seriously affected monuments and historic buildings.

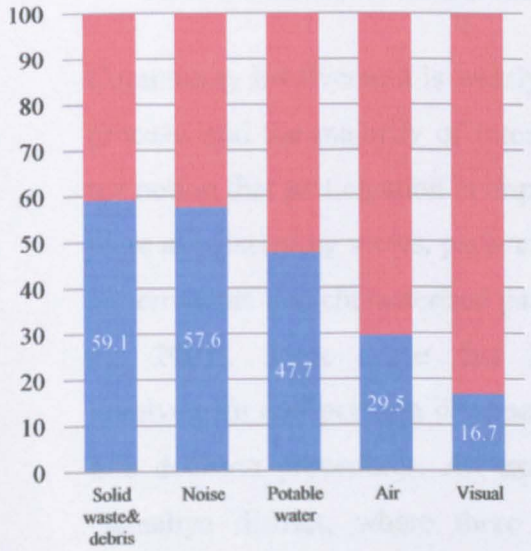


Figure 5.12 Forms of pollution affecting historic Cairo

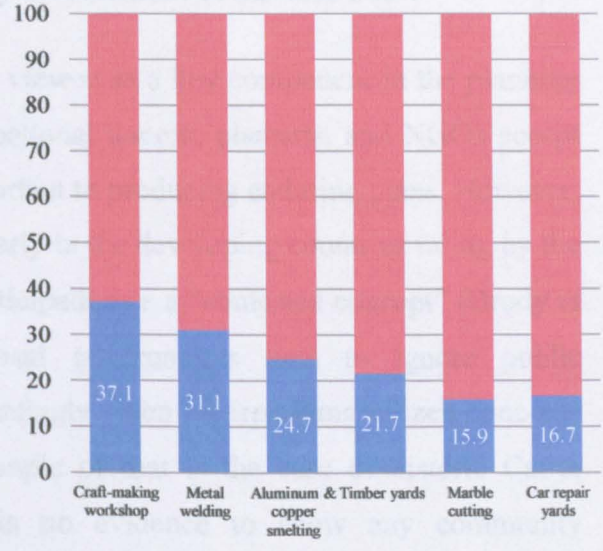


Figure 5.13 Industries causing noise pollution

The survey shows that solid waste and debris is the dominant type of pollution affecting historic Cairo reported by 59.1% of the sample, followed by 57.6% reporting noise pollution (figure 5.12). In addition, people believe that the industries causing noise pollution in historic Cairo are craft-making workshops, 37.1%, followed by metal welding, at 31.1% as mentioned in figure 5.13. Besides, the majority of the sample - 90.9% - wish for the removal of the noisy craft workshops that are not compatible with the authenticity of the area, in respect of the traditional handicrafts that were there originally (brassware artisans, for example). It has been suggested when interviewing Dr. Asaad Nadim, N.A.D.I.M. Center, that relocating noisy activities caused the gradual appearance of incompatible activities within the area. Having talked with the residents and the shop owners, it is evident that there have been no channels of communication between them and the government in order to identify the problems and people's needs. Residents have not yet achieved the aspired outcome; whether socially, culturally or economically.

This section has illustrated the relatively high awareness of the respondents to the problems facing the district. Respondents have given many suggestions and recommendations which hold significant weight in proposing design guidelines for the development of historic Cairo. It also confirms that people are looking forward to changing the current conditions of this heritage district.

5.1.4 Potential for community involvement in historic Cairo

Community involvement is widely viewed as a key component in the planning process, and the majority of international donors, planners, and NGOs accept the notion that participation is important to producing enduring plans. However, there are dissenting views, particularly in the developing countries ruling by the governments that characterised participation as a "contested concept" (Brody et al., 2003). Some argue that local governments tend to ignore public involvement and perform disappointingly when incorporating citizen concerns into decision procedures. An example of that is the case of historic Cairo, Gamaliya district, where there is no evidence to show any community participation or involvement, or that the planning and implementation process considers the bottom-up approach. Mostly, the development interventions

implemented have been based on centralised government institutions within the Ministry of Culture and its acting organisation SCA (Supreme Council of Antiquities).

5.1.4.1 Government attitude and intention towards historic Cairo

Recently, starting from the Egyptian presidential election of 2005, the Egyptian government policy reforms have been designed to deliver a more speedy, flexible and responsive planning system. Those policy reforms have aimed to encourage stakeholder involvement, knowing that this would provide opportunities for the community to have their say and express their views in how their community could be planned and developed. However, according to the survey, 52.3% (discouraging and strongly discouraging) of the respondents believe that the blurred government attitude has a negative impact towards involving the local citizen in the preliminary stages of the planning process (figure 5.14).

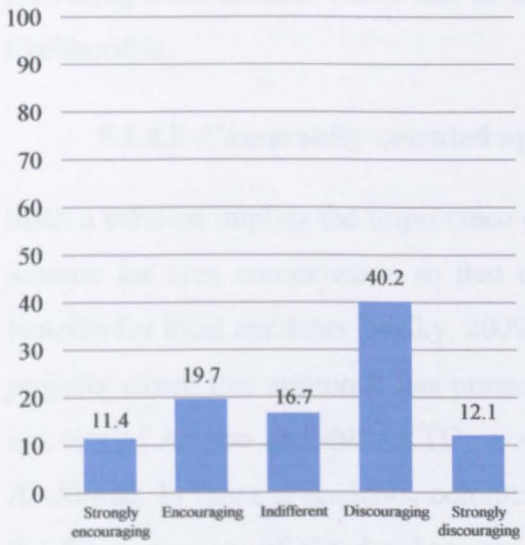


Figure 5.14 Attitude of the government towards involving local residents

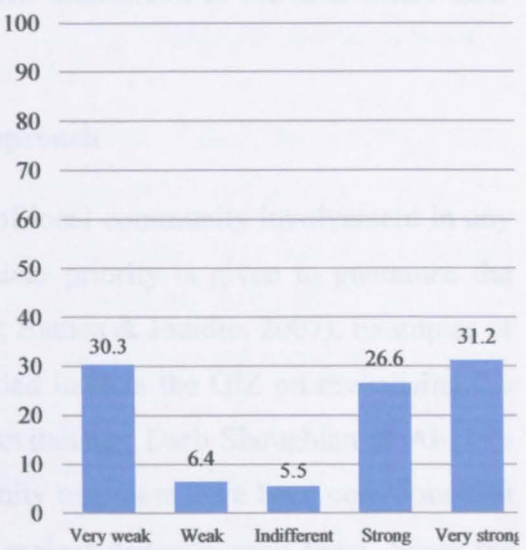


Figure 5.15 Government intention towards developing cultural heritage site

From figure 5.15, 36.7% (very weak, weak) of the respondents have reported that government intention towards developing historic Cairo is quite weak. The government policies and State of Emergency disrupt the community-based initiatives. Residents fear the potential negative influence of any housing improvement plan or infrastructure upgrading. This negative influence might be on aspects concerning their livelihood, or the consequences of relocating.

Thus, there are inadequate government approaches towards preserving cultural values, and facilitating the environmental and social needs of local communities. Several official organisations in Egypt, as the National Organization for Urban Harmony (NOUH) and Historic Cairo Program (HCP), have given recognition to the importance of environmental and visual integrity of historic areas. However, their structure and functional integrity have not been given the same credit. This heritage site's authenticity is threatened by excessive official focus on development, without adequate attention to its unique combination of cultural and community values. Article 40 of Law 3 of 1982 does not promote any cultural approach when demolishing dilapidated buildings in historic sites. It also does not require the comprehensive redevelopment of the historic area when demolished. Of the respondents, 38.2% would agree to move from their dwellings if the Cairo governorate would provide alternative accommodation either within this area or in any settlements outside historic Cairo. However, the majority reported they would not consider relocating from historic Cairo due to their attachment to the area where their livelihood is.

5.1.4.2 Community-oriented approach

Such a concept implies the importance of local community involvement in any scheme for area conservation so that clear priority is given to guarantee the benefits for local residents (Sedky, 2009; Bianca & Jodidio, 2007). Examples of projects where this approach has prevailed include the GIZ on revitalising the old city of Aleppo and the AKTC on revitalising Darb Shoughlan in Al-Darb Al-Ahmar. In those precedents, community members have been conscious that the future success of the development project depends upon them. Since the projects had already been initiated, community members were only left with the option of exploiting it to the utmost.

According to the survey, 87.1% of the respondents have not been involved in any planning or development process during the last three years as shown in figure 5.16; however, they are willing to take part in the development projects implemented in historic Cairo, if they were given the opportunity. Furthermore, figure 5.17 reflects residents' willingness to participate in the future stages of

the project's implementation, maintenance, and follow-up efforts. Among those who have not participated before, 69.8% report their willingness to participate in the future. Notably, among the districts of historic Cairo, Al-Darb Al-Ahmar (ADAA) has scored the highest percentage (71.7%) of people willing to participate in the near future in the planning process of development initiatives.

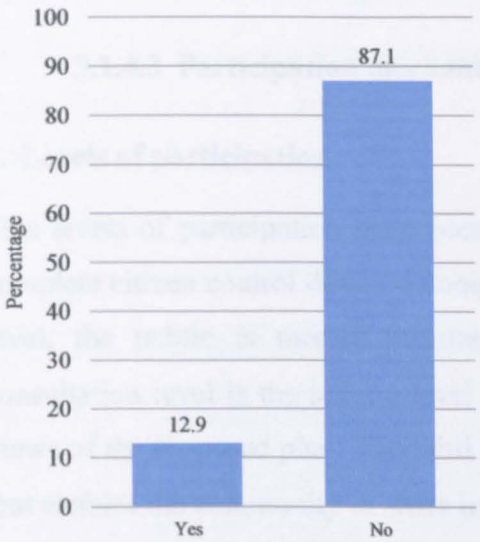


Figure 5.16 Involved in any development process during the last three years

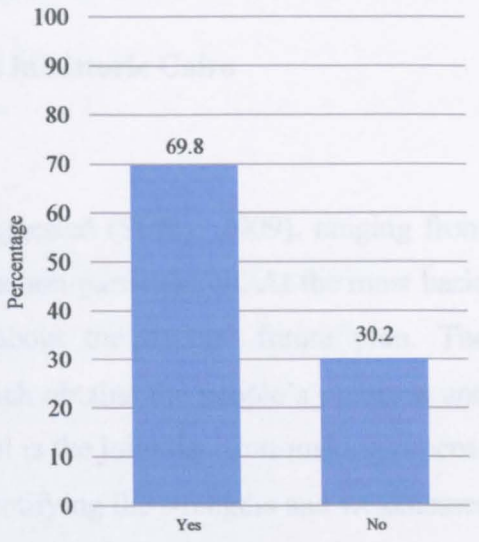


Figure 5.17 Willing to participate in the future

There are three levels of NGOs operating in historic Cairo. The first type is the neighbourhood NGO, for instance, Qasr al-Sham NGO in Old Cairo (Misr Al-Qadima), established by residents from the local communtiy to arrange important facilities for the community.The second type is the NGO established by activists, or cultural heritage specialists, concerned with social development and safeguarding culture. For instance, the Fatimid Cairo Development Agency (FCDA) and Asala in ADAA district are concerned with preserving traditional art and offer training in diverse fields to the local community. The third type is the NGO of an international nature with a wide-scale concern, as those focusing on social development or environmental upgrading; for instance, the Friends of Environment Development Association (FEDA) and Sustainable Development Association for Gamaliya (SDAG) in Gamaliya district.

According to the survey, 31.8% of the respondents believe that the role of NGOs in historic Cairo is still not effective enough, due to the governmental restrictions on the role and management of NGOs in Egypt. Although there were some changes after Law 33 of 1964 was amended by Law 153 of 1999,

concerning regulating the role of NGOs in Egypt (Schade-Poulsen et al., 1999), there were not significant. Restrictions still remain as obstacles towards receiving foreign aid or grants. The priority of the government is given to national security and the permanence of the State of Emergency (Sedky, 2009). NGOs in Egypt are viewed with suspicion and are not encouraged to participate effectively in community and environmental development.

5.1.4.3 Participation mechanisms in historic Cairo

1. Levels of participation

Five levels of participation have been suggested (Sedky, 2009), ranging from complete citizen control down to complete non-participation. At the most basic level, the public is merely informed about the official future plan. The consultation level is the second level which obtains the people's opinions and views of the proposed plan. The third level is the joint decision-making process that enables the community to share in identifying the strengths and weaknesses of the area and to help formulate the priorities (Abada,2008). The level of the joint action involves local residents not only in planning work under technical guidance but also in making decisions. The highest level is independent decision makers such as private property developers (Fahmi & Sutton, 2003).

Concerning the level of participation preferred by the respondents, 13.2% of the sample prefer to participate financially only and choose the most basic level, and 21.8% wish to participate in the consultation level to state their views and aspirations, while the majority, 65%, choose the third level to participate in the decision-making process. The suitable level of community involvement depends on the particular context of each project, as in the case of historic Cairo. There was more than one approach within the same project. In ADAA district, residents were pleased with the AKTC project as the work incorporated their participation at the level of joint decision-making and at times reached the level of joint action; in Gamaliya, however, 68.4% do not think there is an effective participation mechanism in historic Cairo. Residents know that they are affected by the decisions and that they have the right to be involved in any level during the planning process. Effective participation and active local communities are prerequisities for the successful delivery of area conservation.

2. Stakeholders' attitudes towards the development and conservation of historic Cairo

As illustrated in figure 5.18, the residents' attitudes towards the development of historic Cairo measured by 10 statements using a Likert-type scale, ranging from strongly disagree (1) to strongly agree (5). The researcher combined the results into two categories, disagree and agree, as some Likert-type scales have too few observations to meet the assumption of chi-square testing (discussed later in the chapter), upon which the computation of correlation coefficient relies (Wadley & Ballock, 1980).

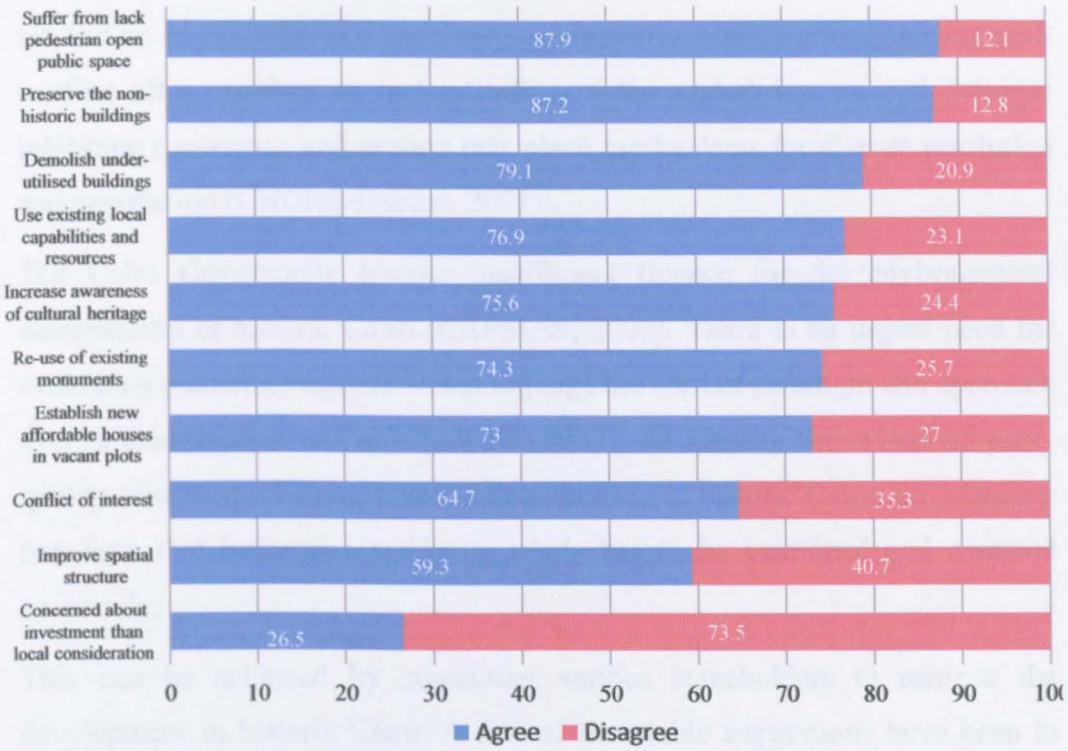


Figure 5.18 Users' attitudes towards development of historic Cairo

The majority of the respondents - 87.9% - suffer from the lack of both pedestrian pathways and open spaces. Also 87.2% of the respondents suggest that NGOs and international aid organisations could offer loan or incentive programmes to maintain non-historic private houses in historic Cairo. Of the respondents, 76.9% agree that using existing local facilities and resources effectively is crucial. Respondents suggest formulation of realistic and replicable policies for implementing and managing building mechanisms using

available resources. In addition, 74.3% of the respondents believe that the area requires re-use of existing monuments and significant buildings.

According to the survey, 64.7% of the respondents agree that conflict of interest may hinder development in historic Cairo. However, it has been argued that a shared dialogue and partnership at the starting point of planning processes is required between different stakeholders with different levels of power, interest, and resources (Creighton, 2005; WB, 1996). Nevertheless, achieving consensus and reconciliation between various stakeholders is not always easy; it may bring risks, such as generating or aggravating conflicts among groups with competing interests and priorities. Consequently, different stakeholders can interact on an equitable and genuinely collaborative basis. Besides, dealing with conflict often requires an understanding of the underlying societal interests inhibiting consensus, and putting into place mechanisms for dispute resolution and negotiation (UNCHS-Habitat, 2001).

The Cairo Governorate blames insufficient finance for the environmental deterioration of historic Cairo (CAPMAS, 2009). There is an urgent need for evaluating guidelines against which to judge the current paradigm and approach to area conservation in Cairo (AKTC, 2007). To identify the causes of poor-quality schemes and environmental deterioration of historic Cairo, the planning paradigm that influences residents' needs has to be examined and assessed accurately.

This can be achieved by consulting various stakeholders to achieve the development in historic Cairo. A few of the viable suggestions have been to remove the metal pedestrian bridge (overpass) serving as the link for Al-Muizz Street and replace it with either a pedestrian tunnel or zebra crossing in Al-Azhar Street; develop new activities and relocate some activities and workshops that cause different forms of pollutions and are not compatible with Historic Cairo; relocate the cemetery (east and south cemetery) outside historic Cairo as it occupies a large area; and invest in projects that generate revenue for continuous conservation of historic Cairo.

5.2 DESCRIPTIVE STATISTICS IN HISTORIC CAIRO

The research has investigated the correlations undertaken by previous researchers, both in designing the questionnaire as well as in performing correlations. Most of the correlations used in this research have been adopted after Lund (2002), Shen et al (2009), USAID (2008), Wadley (2010), Wadley and Balloock (1980) and Zehner and Marans (1973). Several of those research projects have investigated satisfaction of stakeholders with their environments, and have measured stakeholders' attitudes towards participation in the development of their context.

5.2.1 Satisfaction in historic Cairo

To examine the effect of historic Cairo's urban context on the satisfaction of the respondents, this section examines the correlation between 'mean' satisfaction score in historic Cairo and 'mean' public perception towards the urban environment (item scores). Notably, it has been found that 65.1% of respondents are satisfied with historic Cairo and agree that the area is not considered a slum area.

Table 5.1 Correlations between 'mean' satisfaction score in historic Cairo and 'mean' public perception towards the urban environment (item scores). (Source: The researcher)

Independent Variable : Satisfaction in historic Cairo	**Sig tailed _p**	**Correlation coefficient _r**	**Adjusted RSquare _t**
Sense of place***	0.01	0.286*	0.054
Length of residency	0.362		
Attitude towards spatial network***	0.01	0.242*	0.076
Heritage corridor	0.43		
Physical Islamic monuments	0.389		
Perception of walking***	0.001	0.693**	0.118
Accessibility in HC	0.054		
Sense of community***	0.03	0.188*	0.028
Re-use historic monuments	0.47		
Safety and security***	0.01	-0.232*	0.031
Attitude of NGOs***	0.047	0.173*	0.023
Perception towards HC(slum)***	0.01	0.338*	0.108
Intention to participate	0.183		
Consider participation in future***	0.004	0.421**	0.112
Expected impact of participation ***	0.01	0.270*	0.057
Influence on decision	0.119		

* Correlation is significant at the 0.05 level (two tailed)
** Correlation is significant at the 0.01 level (two tailed)
*** Only significant correlations are shown.

Satisfaction is proven to have a significant correlation with sense of place, attitude towards spatial network, perception of walking in historic Cairo, sense of community, attitude of NGOs towards involving users, overall perception towards historic Cairo, consider participation in future, and impact of participation expected. About half of the respondents who reported their satisfaction with the area agree that the 'sense of place' is one of the major potentialities of the area. Meanwhile, 65% of satisfied respondents believe the widespread solid waste and debris is one of the major problems of the area.

There is a strong positive correlation between satisfaction and perception of walking in historic Cairo (r =0.693, *p* two tailed <0.05) as shown in table 5.1. This is because historic Cairo has a distinctive architectural identity and has the largest concentration of Islamic monuments in the world. This enhances the sense of belonging within this authentic place. According to regression linear analysis, the adjusted RSquare is 0.118, which means that 11.8% of 'satisfaction' is determined by the 'perception of walking in historic Cairo' (while 88.2% of the 'satisfaction' is caused by other factors).

In addition, a moderate correlation appears between 'satisfaction' and 'consider participation in future' (r =0.421, *p* two tailed <0.05), due to the notably raised awareness among users of the significance of participation in solving the problems in historic Cairo. According to regression linear analysis, the adjusted RSquare is 0.112, which means that 11.2% of 'satisfaction' is related to 'considering participation in the future' (while 88.8% of the 'satisfaction' is caused by other factors). More than half the people who reported they are satisfied (65%) are willing to participate in development plans. Besides, 57% of satisfied people think there could be an effective role for NGOs in decision making, whereas 55% agree that the national policies hinder local community involvement.

Moreover, there is a moderate positive correlation between satisfaction in historic Cairo and perception towards historic Cairo (r =0.338, *p* two tailed <0.05) as mentioned in table 5.1. However, historic Cairo has been suffering from a sequence of serious dilemmas for many decades, which have affected the traditional urban and social fabric of the historical areas. Some of those problems are the lack of necessary maintenance of the buildings, and the

collapse of their infrastructure. However, the majority of respondents have agreed that they have a positive perception towards historic Cairo, rather than seeing it as a slum area. According to regression linear analysis as shown in table 5.1, the adjusted RSquare is 0.108, which means that 10.8% of 'satisfaction' is related to 'perception towards HC' (while the remaining 89.2% of the 'satisfaction' is caused by other factors).

There is a weak correlation between satisfaction in historic Cairo and other variables such as attitude towards spatial network, sense of community, attitude of NGOs towards historic Cairo and impact of participation expected, as illustrated in table 5.1. It has also a negative weak correlation with lack of safety and security which indicates these are not major problems.

5.2.2 Willingness to participate in historic Cairo

To measure the effect of historic Cairo's urban environment on the willingness of the respondents to participate, the survey examines the correlation between 'mean' intention to participate during the planning process and 'mean' public perception towards the urban environment (item scores).

Table 5.2 Correlations between 'mean' intention to participate during the planning process and 'mean' public perception towards the urban environment (item scores). (Source: The researcher)

Independent Variable :intention to participate	**Sig tailed _p**	**Correlation coefficient _r**	**Adjusted RSquare _t**
Improve spatial structure	0.004	0.396**	0.087
Prefers personal welfare	0.05	-0.170*	0.036
Perception of walking	0.05	0.165*	0.030
Current policies hinder community aspirations	0.002	-0.421**	0.092
Re-use historic monuments	0.05	0.170*	0.029
Increase awareness of cultural heritage	0.05	0.169*	0.024
Perception towards HC (slum)	0.01	0.185**	0.032
Sense of community	0.007	0.388**	0.071
Solid waste debris accumulation	0.05	-0.162*	0.026

* Correlation is significant at the 0.05 level (two tailed)
** Correlation is significant at the 0.01 level (two tailed)
Only significant correlations are shown.

Intention to participate in this research refers to an indication of the respondents' willingness to be involved and engaged during the planning process. Intention to participate has a positive significant correlation with many

factors such as positive attitude towards the improvement of spatial network, perception of walking inside historic Cairo, sense of community, re-use of historic and significant buildings, overall attitude towards historic Cairo (slum), and increased awareness of cultural heritage. There is a negative weak correlation between participants' intention to participate, and a few would choose personal welfare over local community welfare.

There is a moderate positive correlation between willing to participate and attitude towards the improvement of spatial network (r =0.396, *p* two tailed <0.05) as shown in table 5.2, due to the intention of respondents to improve the internal spatial structure in historic Cairo. People complain about unsafe and segregated areas and would like to increase 'eyes on the street'. The respondents prefer to raise awareness among local members and users about the positive impact of cycling and walking in this World Heritage Site to enhance surveillance in the segregated areas to alleviate crime and vandalism. According to regression linear analysis, the adjusted RSquare is 0.087, which means that 8.7% of 'intention to participate' is determined by 'attitude towards the improvement of spatial network' (while 91.3% of the 'intention to participate' is caused by other factors).

Intention to participate has a moderate positive correlation with sense of community (r =0.388, *p* two tailed <0.05) as shown in table 5.2. As historic Cairo is one of the world heritage sites, respondents reported that members of the community who share a sense of belonging to their historic context have an intention to participate. This sense of belonging creates a feeling of emotional safety within the larger community. According to regression linear analysis, the adjusted RSquare is 0.071, which means that 7.1% of 'intention to participate' is determined by the 'sense of community' (while 92.9% of the 'intention to participate' is caused by other factors).

There is a moderate negative correlation between 'willingness to participate' and 'current policies that hinder local residents and NGOs' aspirations' (r = -0.421, *p* two tailed <0.05). As mentioned above, the State of Emergency hampers the political understanding towards the value of involving NGOs and stakeholders. The respondents are complaining about this issue and urge the government to change its attitude towards community involvement. According

to regression linear analysis, the adjusted RSquare is 0.092, which means that 9.2% of 'intention to participate' is determined by the issue of 'current policies hindering involvement' (while 90.8% of the 'intention to participate' is caused by other factors). On the other hand, a weak correlation appears between 'willingness to participate' and other factors, such as perception of walking inside historic Cairo, stakeholders prefer their personal welfare, re-use of historic and significant monuments, increase awareness of cultural heritage, perceptions towards HC (slum) and solid waste debris accumulation, as shown in table 5.2.

From the questionnaire analysis, several indicators have been found when cross-tabulated with 'respondents who are willing to participate in the development process in historic Cairo'. Of those, 66% believe that historic Cairo should not be perceived as a slum area. A high percentage, 86%, agrees to the urgent need of new design guidelines to be implemented in the area.

Concerning personal needs, 30% of those willing to participate believe that improving the quality of life is one of the main human requirements, while 28% consider that household overcrowding and lack of health facilities are major problems in the area. In this context, 81% would prefer to develop vacant and ruined plots in establishing new projects and facilities that may generate revenue for the area; while 91% believe that the provision of safe pedestrian routes and more open spaces would help develop the area dramatically.

Over half of the respondents (51%) who are willing to participate believe that their participation could help improve the area's spatial structure. About half of the respondents consider that their participation might actually shape final decisions in their community. However, 71% are concerned that the conflict of interest between stakeholders may affect the final decisions of decision makers.

5.2.3 Perceptions towards development of historic Cairo

By investigating the correlations of perceptions and opinions of respondents towards the development of historic Cairo, a number of significant correlations have emerged. It has been found that raising awareness among residents about the cultural heritage of historic Cairo has a positive correlation with both the need for improving the spatial structure of the area ($r = 0.275$, p two tailed

<0.05), and demanding the preservation of non-historic buildings (r =0.274, *p* two tailed <0.05). This indicates that stakeholders recognise the effect that implemented improvements (in the spatial network and the deteriorated residential buildings) may have on raising people's awareness concerning the cultural heritage of this area.

Another significant positive correlation appears between three indicators; those who suggest initiating new design guidelines, those who suggest the provision of new affordable homes, and those who propose improving the pedestrian footpaths and the provision of open public spaces. The correlation between design guidelines and provision of new homes is (r =0.408, *p* two tailed <0.05), while the correlation between design guidelines and improvement of pedestrian footpaths is (r =0.407, *p* two tailed <0.05). This shows that respondents believe that forming an appropriate framework of design guidelines which reflects their needs and aspirations is key to successful interventions in the area.

CONCLUSION

The survey has aimed to involve stakeholders in defining the potentialities and constraints of historic Cairo, thus drawing a framework for the design guidelines that are proposed in the following chapter. Notably, historic Cairo's challenges are complex and daunting. Those concerned need to lay out and propose design guidelines for their heritage site as a place of residence and work, a place of tourism, and a place for local and regional trade. They need to respond to community needs and build upon their past and current experience within historic Cairo. This can be achieved by defining the problems and constraints of the development within historic Cairo and developing the stakeholders' insights of the potentialities in historic Cairo.

This chapter has outlined the approach taken to examine the case of historic Cairo. It has explained general survey findings, before performing interpretation through correlations and further statistical analysis. The findings have been highlighted and defined to generate the following points:

- Stakeholders have reported that members within the community share a sense of belonging with their historic context. This sense of belonging creates emotional bonds within the larger community. Stakeholders

agree that the sense of place in historic Cairo is one of the major potentialities that should be preserved and enhanced.

- Problems in the area which reflect people's basic needs for safety and security include overcrowding, lack of infrastructure, poor-quality construction, and bad quality of life. Besides, lack of job opportunities and employment builds on people's social needs of self-esteem.
- Problems of congested street networks and absent pedestrian routes embody an urgent need for implementing new design guidelines that overcome the commuting problems. Stakeholders have demonstrated their awareness of particular tribulations and made feasible and logical suggestions to overcome them.
- Significant sources of pollution have been identified by stakeholders as solid waste and debris, noise, potable water, and air. As they together form an interrelated and destructive combination, people have suggested a possible framework for resolving the deeply rooted predicament of pollution.
- The survey respondents realise the potential of their community as the basic foundation to build self-sufficiency. However, the majority agrees that the government policies and bureaucracy hinder initiatives from individuals and NGOs for development programmes or even consultations to have their say. Individuals have reported their willingness to participate in development interventions and to be involved in the early planning stages of interventions.

Thus, the above-explained survey findings, and implications described form the basic foundation for the next research stage using space syntax technique.

CHAPTER SIX

USE OF THE SPACE SYNTAX TECHNIQUE FOR SUSTAINABLE URBAN DEVELOPMENT OF HISTORIC CAIRO

Chapter Contents

INTRODUCTION

In this part of the study, based on existing GIS maps of historic Cairo, a digitised bank of substantial data has been compiled to form the basis prior to applying space syntax analyses. The aim of this chapter is to develop an urban intervention in historic Cairo based on five principles of sustainable urban development (Smart Growth Network, 2011; Carmona, 2009; Clarke, 2009; EU Working Group on Urban Design for Sustainability, 2004; Rogers, 1997; URBED,1997; Barton, 1996; Haughton & Hunter, 1994; Bentley et al., 1985). These guiding principles are: diversity and choice, distinctiveness, users' needs, self-sufficiency, and pollution reduction. The guiding principles have been based on lessons learnt from precedents, and field work survey (interviews, questionnaire, observations) undertaken in historic Cairo.

The sustainable urban development strategy that the study proposes is built on the strategic challenges and opportunities derived from the analysis of historic Cairo. The improvement strategy in this proposal is to reconnect the isolated and fragmented core of the unplanned areas to the city-wide street grid while preserving their local physical and spatial structures as much as possible. On the one hand, preserving the integrity of the local structure of unplanned areas scattered throughout the historic urban fabric requires a detailed analysis of urban and socio-economic data of its maintainable buildings (such as land use and building quality). On the other hand, finding the best way to connect its core to the global grid requires a fine-scale syntactic analysis. The suggested approach uses a multi-layered analysis to prioritise and translate different spatial and non-spatial data into design-aiding information. It applies the space syntax technique to comprehend and analyse all opportunities and problems in historic Cairo's urban fabric, followed by the proposition of feasible interventions. The proposed design guidelines aim to minimise existing problems whilst generating the maximum positive impact from the development strategy.

6.1 APPLYING SPACE SYNTAX TECHNIQUE IN HISTORIC CAIRO

Space Syntax is founded on an analytical theory of architecture, where existing conditions are measured and fully understood, before an intervention is

developed, tested, and proposed. This approach allows a design to respond directly to the needs of the context in which it is based, thereby improving its chances of success. Urban street configurations of historic Cairo are analysed using the space syntax technique. The basis of this approach is to retain as much as possible of the existing social and urban fabric, creating the maximum positive impact with the minimum disruption. This urban development strategy also aims to preserve and maintain the old city's unique historic character while carrying out spatial transformations and structural adjustments that will enhance historic Cairo's social and economic vitality and diversity.

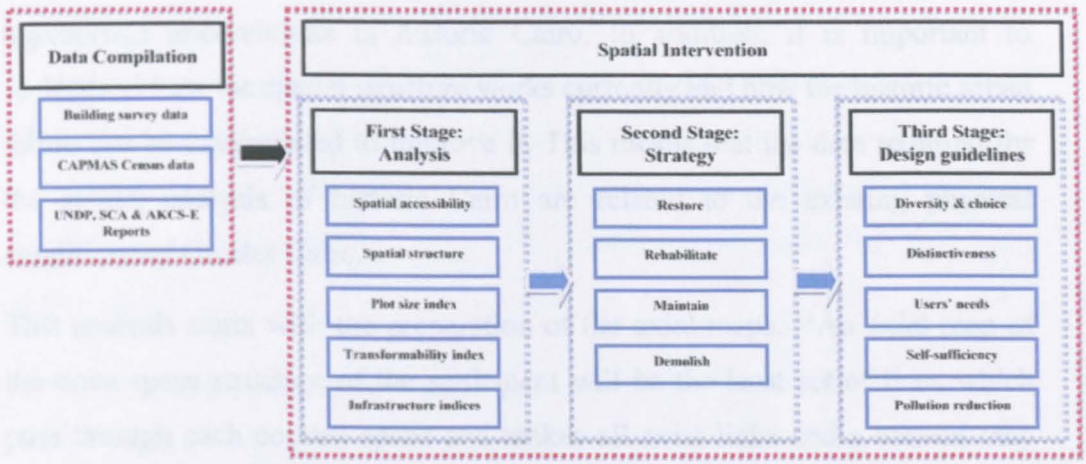


Figure 6.1 An illustrative diagram of the proposed strategy for sustainable urban development of historic Cairo (Source: the researcher)

The proposed strategy consists of three main stages: analysis of the current situation, level of intervention, and the proposed design guidelines for the sustainable urban development of historic Cairo. Prior to the first stage of data analysis, data were compiled and analysed from the Building Survey data, the 2006 Census data and several international organisation reports such as those of the UNDP, the SCA and the AKTC. Besides, the survey findings presented in the previous chapter have also been incorporated as a recent additional and valuable source of data. The survey, which included questionnaires and in-depth interviews, has aimed to engage a variety of stakeholders' opinions and views in the process of developing the proposed interventions. The strategy is illustrated in figure 6.1.

The analysis stage involves creating multiple layers, including spatial accessibility, spatial structure, plot size, and transformability indices. The

second stage, level of intervention, develops four possible levels of intervention for each of the conditions analysed; restore, rehabilitate, maintain, or demolish. The final stage is proposing design guidelines for the main urban zones in historic Cairo, based on the five design principles explained in chapter four. The following sections explain and illustrate the three stages applied in this research.

6.2 FIRST STAGE: ANALYSIS

Firstly data compilation is required before the analysis is performed. This involves optimising a spatial structure and proposing a strategy to develop appropriate interventions in historic Cairo. In addition, it is important to understand how the spatial structure works currently and how the historic urban fabric can be manipulated to improve it. This means that the data required for the spatial analysis of historic Cairo are related to the existing physical conditions of Greater Cairo.

This analysis starts with the preparation of the axial maps. "An axial map of the open space structure of the settlement will be the least set of lines which pass through each convex space and makes all axial links and a convex map will be the least set of fattest spaces that covers the system" (Hillier & Hanson, 1984, pp.91-92). The axial map is analysed as a segment model using DepthMap software that perform the required calculations. "The outcomes separate segregated and integrated areas, where the latter are identified as the core of the settlement, the integrated core, and comprise the streets with the highest probability of people passing through" (Önder & Gigi, 2010, p.261).

Two different sets of analyses were conducted in historic Cairo to identify the urban pattern; the global scale (Rn) and the local scale (R800). The global scale analysis (Rn) was used to recognise the relationship between each axis and all other axes. This scale helped reveal the degree of integration and segregation in historic Cairo. The spaces that fall in the integration core are public spaces serving both local users and visitors to historic Cairo. The urban structures "using the usual space syntax technique of colour banding values from red to blue, resemble those produced by least line, or axial, analysis, but are always more detailed and penetrate farther into the different parts of the

system" (Hillier, 2009, p.K01:4). The second analysis, the local scale (R800), helped identify the relationship of an axis with its neighbouring axes at a radius of 800 metres. This identifies the hierarchy of the sub-areas where local users were likely to encounter each other (Karimi et al., 2007). The structure of the centre changes with increasing radius. At R800metres a complex of centres and sub-centres appears. The centre becomes weaker as the scale increases to 2000 metres, until infinity radius (Rn) (Hillier, 2008).

The data analysis is used to provide responses to the spatial structure and to develop strategies for further interventions to support these spatial changes. Spatial analysis measures overall accessibility within Greater Cairo, and the spatial structure of historic Cairo, and begins to shape the amount of physical intervention required. The non-spatial factors (building height, conditions, plot size, and available infrastructure, among others) are combined to produce indices of transformability, plot size, and infrastructure of the built environment.

6.2.1 Spatial accessibility analysis

The purpose of the analysis is to identify the type of spatial intervention required, and the amount of intervention to the physical fabric and the public realm needed for a specified area. The analytic experiments are used to understand the urban pattern configuration, and how it works in historic Cairo. An axial map of historic Cairo was drawn using 6090 axial lines while Greater Cairo was drawn using 157,090 axial lines.

The measures used in the analysis include global and local accessibility. Spatial accessibility measures the relationship from each space to every other space in the system. The different scales of spatial accessibility can be best shown by comparing the measures of segment choice analysis for local and global radii, as illustrated in figures 6.2 and 6.3.

The construction and extension plan implemented by the Cairo Governorate in historic Cairo focused on the main routes of Al-Muizz Street and Al-Azhar Street and Al-Azhar tunnel, without taking into consideration the development

of historic inner routes. This led to the current spatial isolation of the historic Cairo centre as shown in figure 6.2.

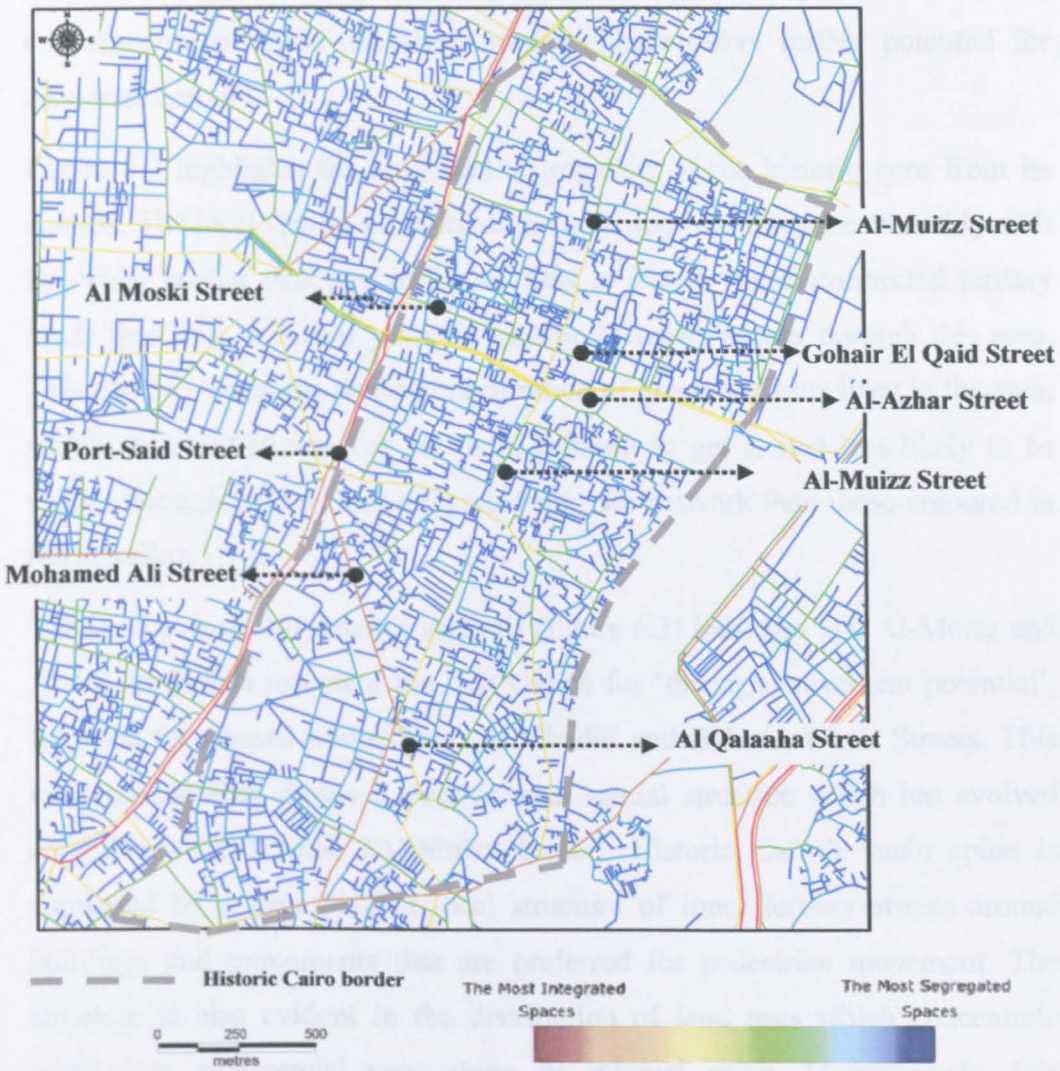


Figure 6.2 Global accessibility choice (segment analysis) Radius Infinity Rn with values coloured on a spectrum of red (high values) to blue (low values) according to equal colour ranges (Source: the researcher)

The city-wide super-grid underlined by higher values of global choice routes run at the west edge (Port-Said Street) of historic Cairo border and in three of the most famous streets in Cairo (Al-Azhar, Al-Muizz and part of Mohamed Ali Streets) as shown in figure 6.2. It shows that the most accessible routes in historic Cairo are Mohamed Ali/Al Qalaaha, Al- Azhar, and Al Moski/Gohair Al Qaid Streets. Those streets (red colour) are highly integrated locally and globally; the level of integration decreases dramatically at the streets next to the most integrated ones and in some cases creates a mass of segregated streets (blue colour). These integrated streets bring many benefits which include the

proximity to the employment opportunities provided by encouraging industries that reflect the authentic image of historic Cairo. An important outcome is that the majority of the significant monuments are mostly located on the convergences of these accessible routes, which offers further potential for economic activity.

Figure 6.2 highlights the structural segregation of the historic core from its context. The local spatial structure of the area does not integrate smoothly with the wider spatial structure of Cairo. This is due to the disconnected tertiary roads that lead to longer journeys and problematic access through this area. This can be seen in the dense concentration of green and blue lines in the area, which represent streets that are more difficult to get to and less likely to be passed through, and so less integrated into the network than those coloured in red or yellow.

The local accessibility choice analysis (figure 6.3) indicates that Al-Muizz and Al Moski Streets represent the first choice for 'through movement potential', followed by Ahmed Maher/Darb Al Ghadid and Bab Al Wazir Streets. This local accessibility shows a clear internal spatial structure which has evolved around a central spine (Al-Muizz Street). Historic Cairo's main spine is supported by a very distinct local structure of inner tertiary streets around buildings and monuments that are preferred for pedestrian movement. The structure is also evident in the distribution of land uses which concentrate small-scale commercial uses along its internal spine. Unfortunately, this structure does not fit into the spatial structure in the urban context of this heritage site. Historic Cairo forms its own local structure, but this local network is not associated with the overall urban grid. In other words, a polarised pattern has emerged in which the organic historic centre emerges as an area with high levels (measures) of local choice, isolated from the rest of Cairo.

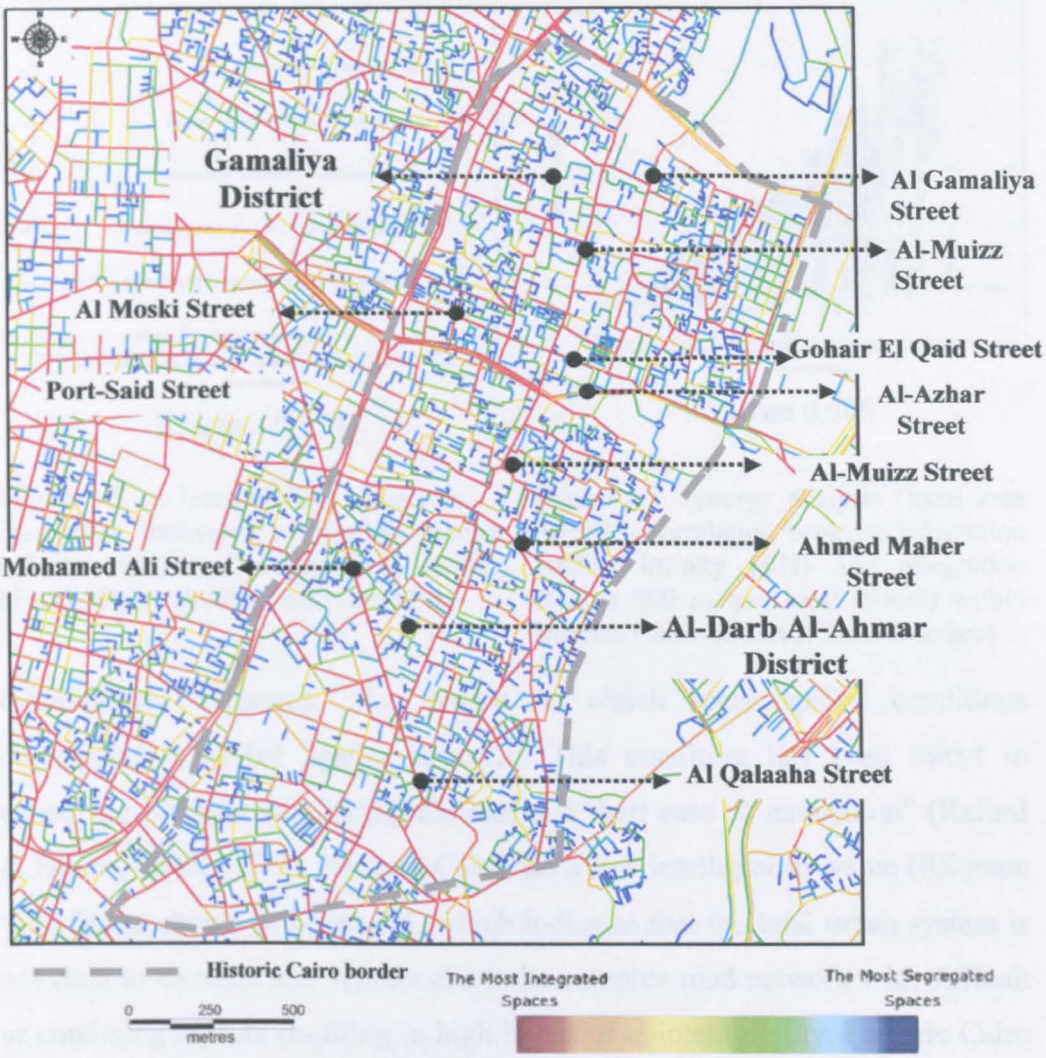
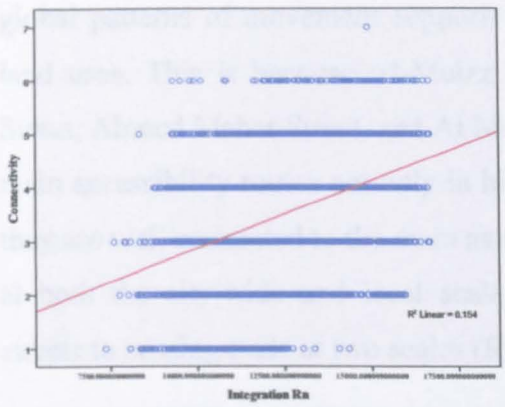


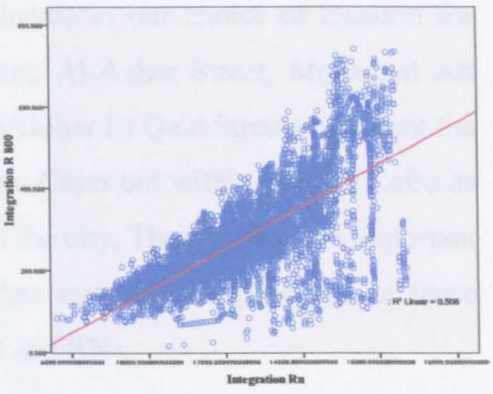
Figure 6.3 Local accessibility choice (segment analysis) Radius R800, with values coloured on a spectrum of red (high values) to blue (low values) according to equal colour ranges (Source: the researcher)

The spatial discontinuity in historic Cairo between the local and the global scale of urban grid impedes its socio-economic improvement in the long term. The impact of the current conditions of historic Cairo not only affects its area but there is a significant knock on effect on Greater Cairo. The internal spine (Al-Muizz Street) is segregated by a main street (Al-Azhar Street) creating a major obstacle in the development of a more linked, and functional city centre.



RSquare 0.154

Figure 6.4 Intelligibility analysis - correlation between Integration Radius infinity (RN) and Connectivity within historic Cairo. (Source: the researcher)



RSquare 0.506

Figure 6.5 Synergy analysis (local area effect) - correlation between integration Radius infinity (RN) and integration Radius 800 metres local (R800) within historic Cairo. (Source: the researcher)

Intelligibility measures "the degree to which local spatial conditions correspond to global spatial structure. This condition has been found to encourage people's wayfinding abilities and their ease of navigation" (Raford & Hillier, 2005, p.573). Historic Cairo has a low intelligibility value (RSquare = 0.154) as shown in figure 6.4, which indicates that the total urban system is not clear to its users and visitors due to its complex road network with difficult or confusing layouts resulting in high levels of unintelligibility. Historic Cairo involves many changes of direction that can make navigation confusing; thereby weakening the relationship between space identification and navigation. Consequently, residential areas in historic Cairo are segregated from the commercial and religious areas within historic Cairo and almost completely isolated from the city centre of Greater Cairo.

As for synergy (local area effect), it is a measure of the correlation between Radius 800 integration and Radius infinity integration (Rn). "This measure reflects how the global structure of a city is reflected in the local structure of space" (Dalton, 2007, p.088:03). Hillier stated that "research has shown that the critical thing about urban sub-areas is how their internal structures relate to the larger-scale system in which they are embedded" (Hillier, 1996, p.99). According to the synergy scattergram in figure 6.5; the Synergy (local area effect) analysis RSquare is equal to 0.506 which indicates moderate connection between local and global areas. The consistent relation between local and

global patterns of movement supports rationale in our choice of location for land uses. This is because Al-Muizz Street, Al-Azhar Street, Mohamed Ali Street, Ahmed Maher Street, and Al Moski/Gohar El Qaid Streets represent the main accessibility routes not only in historic Cairo but within Greater Cairo as they are well connected to the main axes of the city. These streets are important at both the city-wide and local scales, thus exposing shopkeepers on these streets to passing trade at two scales (R800 and RN).

Figure 6.6 Al-Azhar flyover increases the segregation between Al-Darb Al-Ahmar and Gamaliya districts (Source: the researcher)

Notably, these routes intersect to form the most liveable places in historic Cairo (Ali & Rieker, 2010; Bianca, 2007). However, Al-Azhar Street and also the flyover increase the segregation between historic Cairo itself, leading to the inaccessibility between Al-Darb Al-Ahmar and Gamaliya districts as shown in figure 6.6. Studies were proposed during 1994 to replace the flyover by Al-Azhar tunnel in Al-Azhar Square (Sedky, 2009); however, this caused a visual blight in the area which remains to date. Unfortunately the Cairo Governorate has not recognised Al-Azhar tunnel as an effective substitute for Al-Azhar Street due to the high volume of traffic flow. Thus, Al-Azhar Street has not been pedestrianised according to the preliminary plan.

6.2.2 Spatial structure analysis

Spatial structure compares the accessibility overlap between the highest 15% value of selected routes in historic Cairo at the global scale, RN, and the highest 15% value of the same area at the local level R800. The figure is calculated from the number of route segments that overlap, and is weighed by the length of these same segments. A high figure indicates that the local (R800) and global (RN) scales are aligned with each other (red and blue colour) and

that the area is intelligible. A low figure indicates that there is not much of an overlap between these two scales and a physical intervention is required to align them more successfully. This measure has been developed specifically as a design tool for this project and thematic maps have been produced during the design stage to understand which segments overlap.

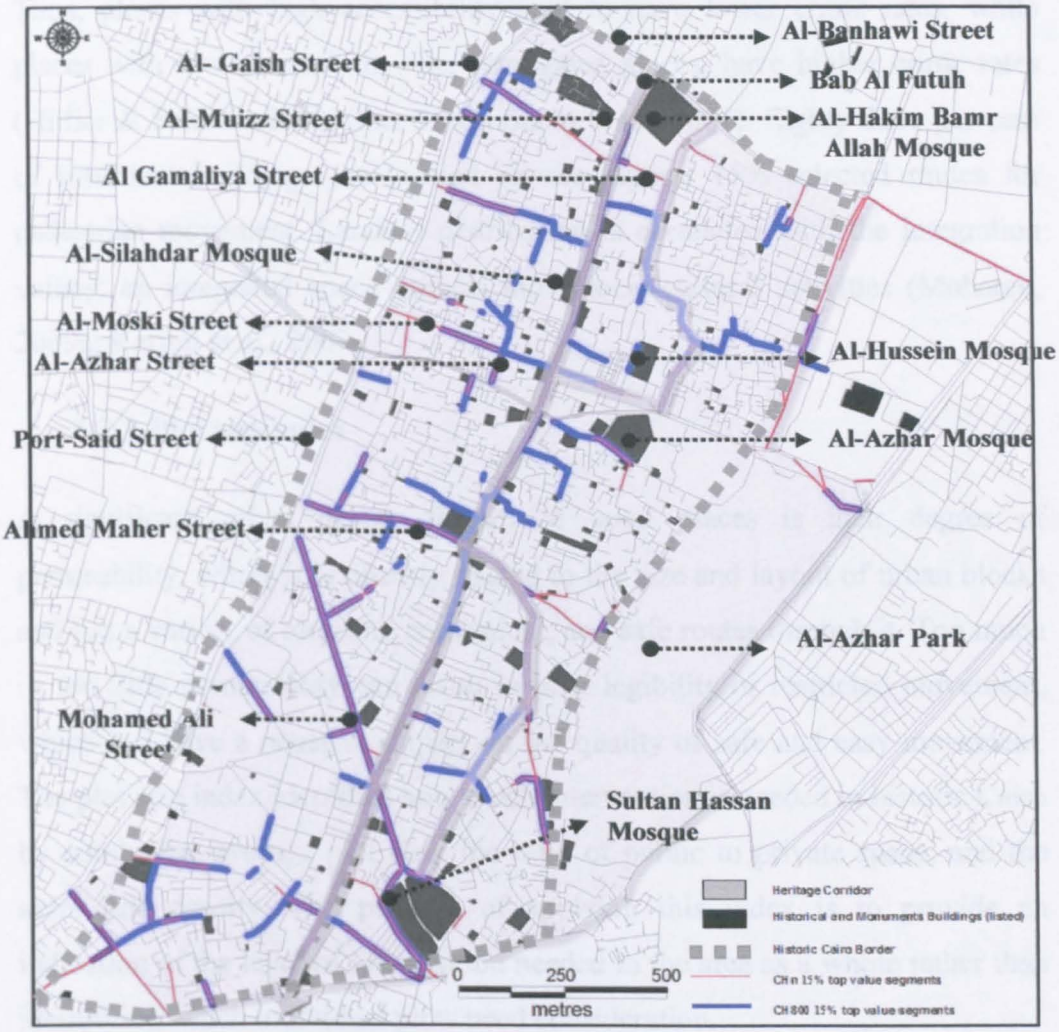


Figure 6.7 Spatial structure map, for the highest 15% selected routes, represents the main heritage corridor and the potential entrance (starting /ending) points for historical Cairo from the main routes. (Source: the researcher)

From figure 6.7, the majority of historical and monumental buildings, mainly religious and daily-used buildings, are mostly located on the highest 15% of route segments value. This indicates that their locations were carefully selected to fulfil their users' daily needs. The commercial zones and the historical and monumental buildings are distributed along the urban historic corridor (Al-Muizz Street) with high accessible routes connected directly to the urban edges. Residential quarters in historic Cairo are segregated sectors, which

reflect increasing high crime rates. On the eastside of historic Cairo, the residential buildings are less accessible and have low-quality living conditions. Hillier (1988) argues that if "the spatial configuration makes the natural movement of pedestrians more difficult, there will not be a sufficient number of people to generate the perception of a well appropriated and used space." Thus, places with high accessibility tend to have lower crime rates, while places with low accessibility, i.e. segregated places, have higher crime rates (Hillier & Sahbaz, 2009; Shu, 2009; Baran et al., 2007). Eighty three per cent of historical buildings are located on the highest 15% selected routes for pedestrian movement. Landuse distribution is correlated with the integration values; an integrated space attracts more socio-cultural activities (Mohareb, 2009a; Karimi et al., 2007).

6.2.3 Plot size index

A significant urban design feature of good places is their degree of permeability, where it is directly related to the size and layout of urban blocks and has a variety of pleasant, convenient, and safe routes through it. Too much or too little permeability can result in poor legibility or restricted movement, which can have a negative impact on the quality of safe and easy movement. The plot size index identifies how much intervention is needed in historic Cairo by combining average plot size, the ratio of public to private space, and the axial line density. The purpose of applying this index is to provide an indication of the level of intervention needed in the area as a whole rather than identifying which individual plots need consideration.

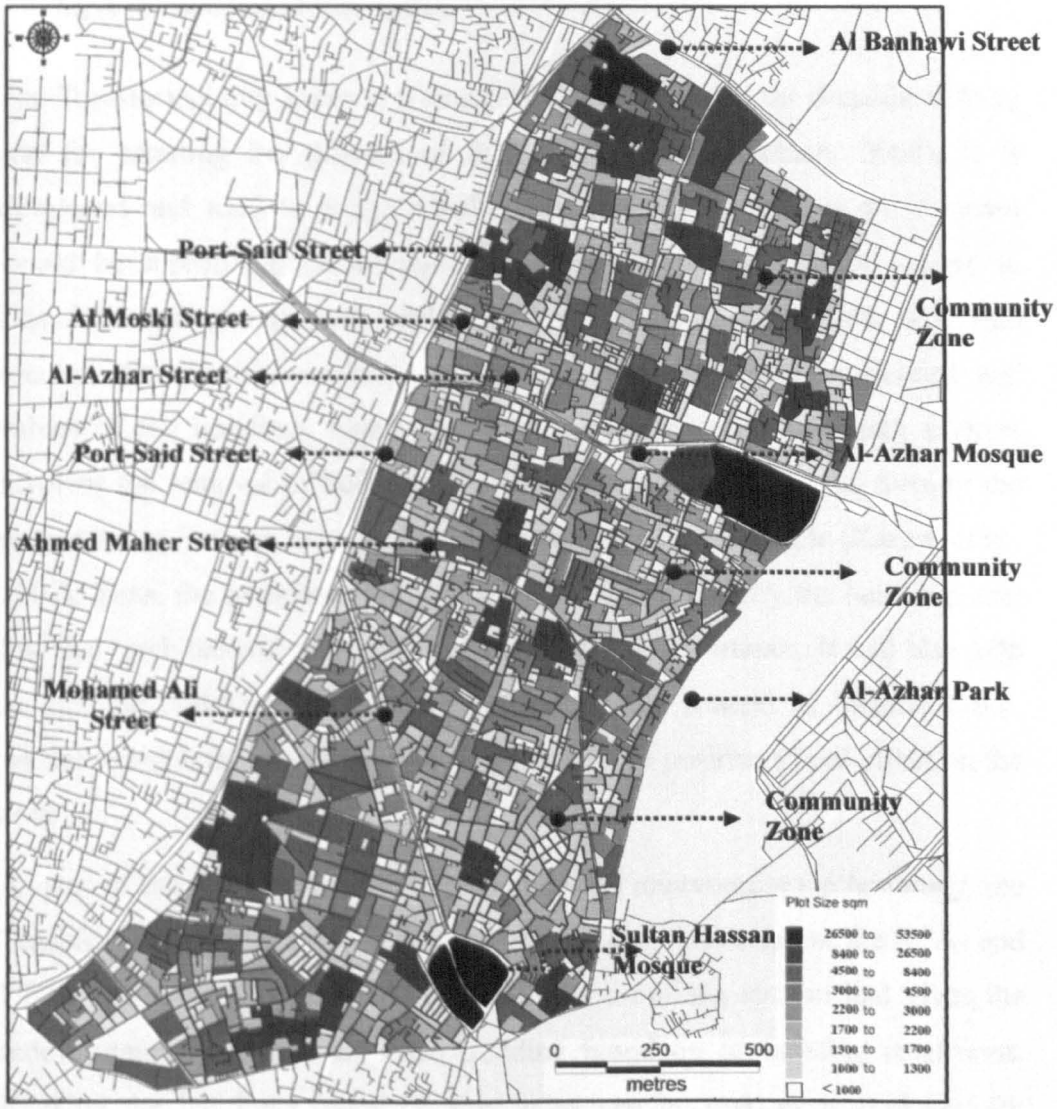


Figure 6.8 Plot size index. (Source: the researcher)

Figure 6.8 highlights that most residential plots in the Community Zone of historic Cairo are characterised by over-permeability; which leads to an increase in unnecessary permeability, further diluting movement activity levels, and creating social risks, whilst the plots near the boundaries of historic Cairo and the monumental plots suffer slightly from under-permeability; large plots, low public to private space ratio, and low axial line density. Thus, these large plots reduce permeability and impede movement, resulting in dead or inactive spaces. Overall, historic Cairo suffers from lack of public spaces, plots which are too small to provide acceptable living conditions for the density of population they accommodate, plots that are too large at the boundaries that cause detached areas from the centre of historic Cairo, and a lack of hierarchy of spatial structure.

6.2.4 Transformability index

The Transformability Index is a composite baseline guide for decision making and for assisting the process of design (Karimi & Parham, 2008). It is developed and used to judge whether the quality of the built environment would be appropriate for adapting the potential spatial structure around it. Decisions concerning permeability and street widening should take into account the existing condition, and architectural or historical interest and values of the buildings along the street. In many cases, widening a street involves the removal of buildings, which subsequently affects the lives of the people living in those areas and the future of the city as a whole (Karimi et al., 2007). Thus, the transformability index will help to identify the buildings that lost their architectural and historical integrity and importance. It will also help in defining buildings that are insignificant to the context of historic Cairo, whereby which their removal will result in a more positive visual effect on the area.

As part of the network identification and design intervention methodology, the Transformability Index has been developed, taking into account the SCA- and UNDP-recommended removal. This index is a ranking system that gives the redevelopment potential for each building based on its existing conditions. Ranking the buildings based on this index can be used as a guideline for decisions related to street design and the degree of physical intervention in each one. The categories used for the index of a building were condition, height, age, material, status of occupation (vacant/occupied), and land use.

Following the investigation of different models and ranking systems by the researcher, it was found that the empirical formula hereby applied complies with the particular conditions of the case of historic Cairo. This empirical formula has been tested and used in several projects completed by Space Syntax Limited in the Middle East (Karimi et al., 2007, p.034:09). The formula for the Transformability Index is: TI = (2 x building condition) + building height+ age of building + material of building +occupation + weighted land use.

This empirical formula, as well as the weighting factors, could be further optimised by additional socio-economic studies, as well as more data, such as land value and land ownership. The building condition, age of building, material of building and occupation are described by a number that shows the weighting inside that particular category, while the land use weighting has been suggested according to the following criteria: religious and monumental buildings should be kept intact, community facilities to be preserved where possible, commercial uses to be preserved where possible, and residential blocks in bad conditions to be redeveloped or demolished where possible. It should be noted that the relevant data have been provided by CAPMAS and the SCA in Egypt.

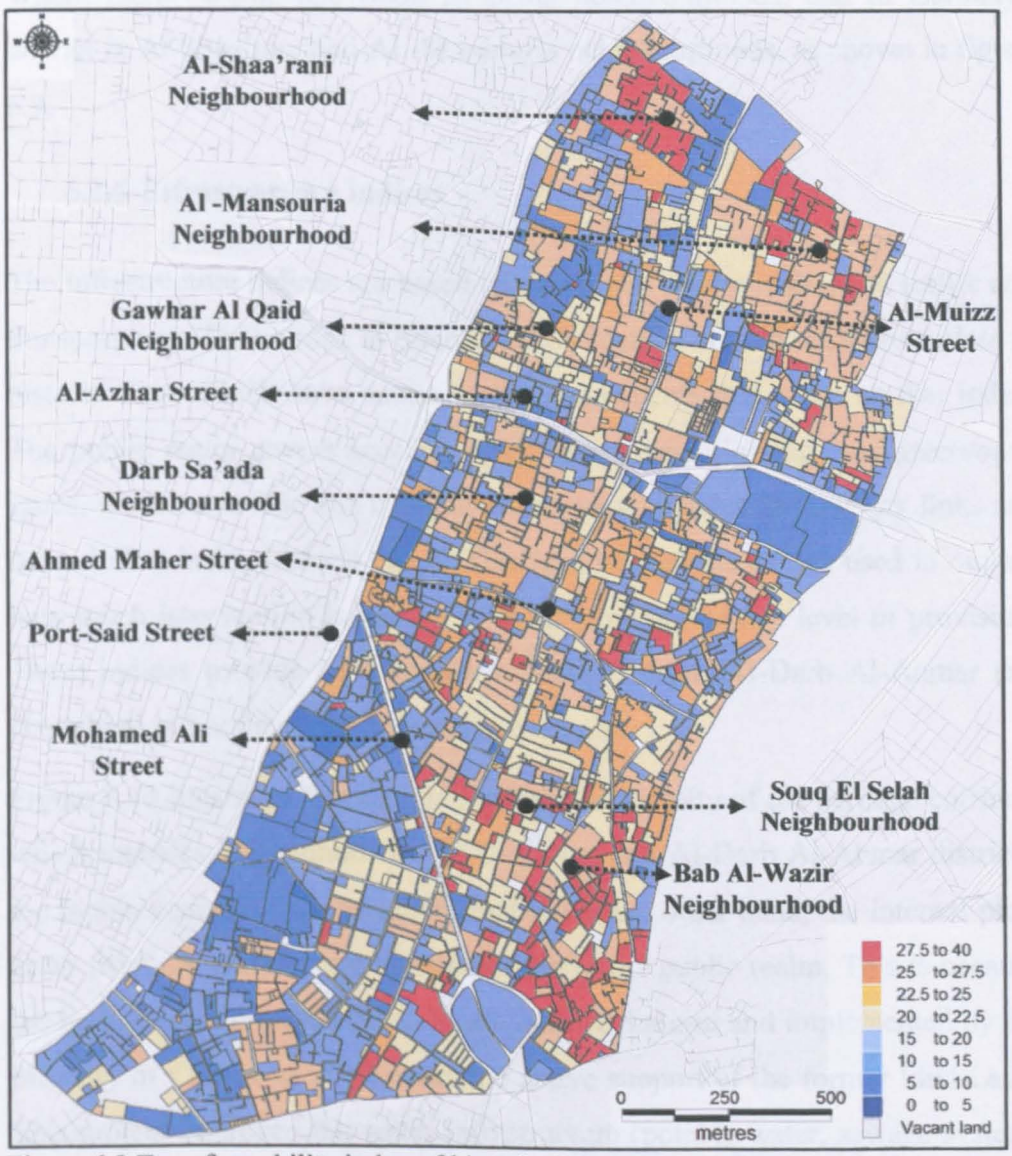


Figure 6.9 Transformability index of historic Cairo (Source: the researcher)

The results of the transformability can be displayed as an image that shows the areas which are less transformable (in good condition), in blue, and the more transformable areas (in bad condition), in red. From the figure above, it is clear that areas of less transformability are distributed along the heritage corridor of Al-Muizz Street and Al-Azhar Street due to the fact that the majority of monumental and significant buildings are located along both streets. Also, there is a high concentration of less transformable plots along and beyond Mohamed Ali Street due to the high density of high-rise buildings. This is shown in the transformability index as low transformability due to the very low possibility for demolishing them. The areas of higher transformability are concentrated mainly in Al-Darb Al-Ahmar district, particularly in Bab Al Wazir, Darb Sa'ada, and Souq El Selah neighbourhoods, and in Gamaliya district in Al Shaa'rani and Al -Mansouria neighbourhoods, as shown in figure 6.9.

6.2.5 Infrastructure indices

The infrastructure indices are based on two types; public realm, and traffic and transportation. Each index is established on identifying the number of plots in historic Cairo which have access to the components that make up that index. The public realm covers access to pavement, street lighting, and green/open space, while the traffic and transportation index includes the network links and accessibility inside historic Cairo. This type of analysis can be used to outline how much intervention is needed to achieve an acceptable level of provision. These indices provide an overview of each district (Al-Darb Al-Ahmar and Gamaliya) rather than a breakdown of each plot.

Figure 6.10 illustrates that the plots within the vicinity of the heritage corridor, which includes 313 monuments in Gamaliya and Al-Darb Al-Ahmar districts, are highly accessible to the public realm. On the other hand, the internal plots away from the corridor are less accessible to the public realm. This is because the heritage corridor (Al-Muizz Street) was revitalised and implemented by the Ministry of Culture in 2009 under the active support of the former First Lady. This project improved the water infrastructure (potable water, sewage system)

and transformed the unpaved Al-Muizz Street into basalt and granite, besides creating an open space opposite Al-Hussein Mosque.

In the Dar Shoughlan neighbourhood, the plots near the Bab Al Mahruq (access to Al-Azhar Park) are highly accessible to the public realm; the plots that have less accessibility to the public realm are concentrated mainly in Bab Al Wazir, and Al-Batneyya neighbourhoods. Unfortunately, the Ministry of Culture and Cairo Governorate's priority was to safeguard the monuments rather than the entire area as an integrated whole (SCA, 2002).

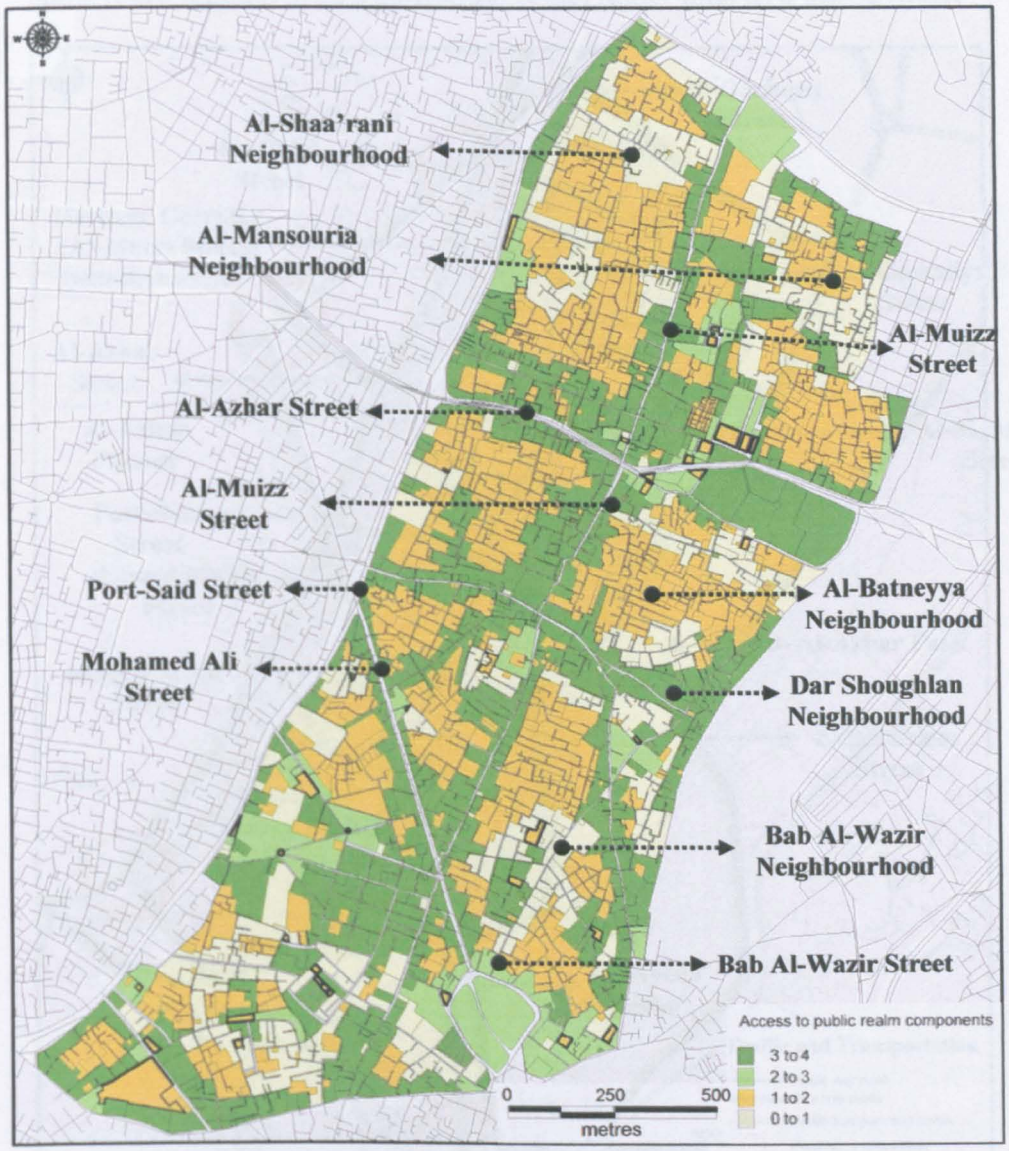


Figure 6.10 Level of accessibility to public realm components. The higher the value the higher the accessibility to the public realm (Source: the researcher)

As for the traffic and transportation infrastructure index; most network links and accessibility inside historic Cairo suffer from severe traffic congestion

during peak hours. This is due to the high volumes of vehicles in the organic-patterned network and high number of dead-end streets where roads and sidewalks are used for commercial activities. This organic configuration of historic Cairo's path system is unsuitable for heavy modern traffic conditions and accessibility is very limited as a result. Except for the recently created (and now heavily used) roads of varying widths, surface conditions are poor. Al-Muizz Street (1300 metres long), for example, has been converted to a pedestrian street between the hours of 9am and 9pm. This makes the historic spine more functional as a pedestrian route, rather than as a traffic route.

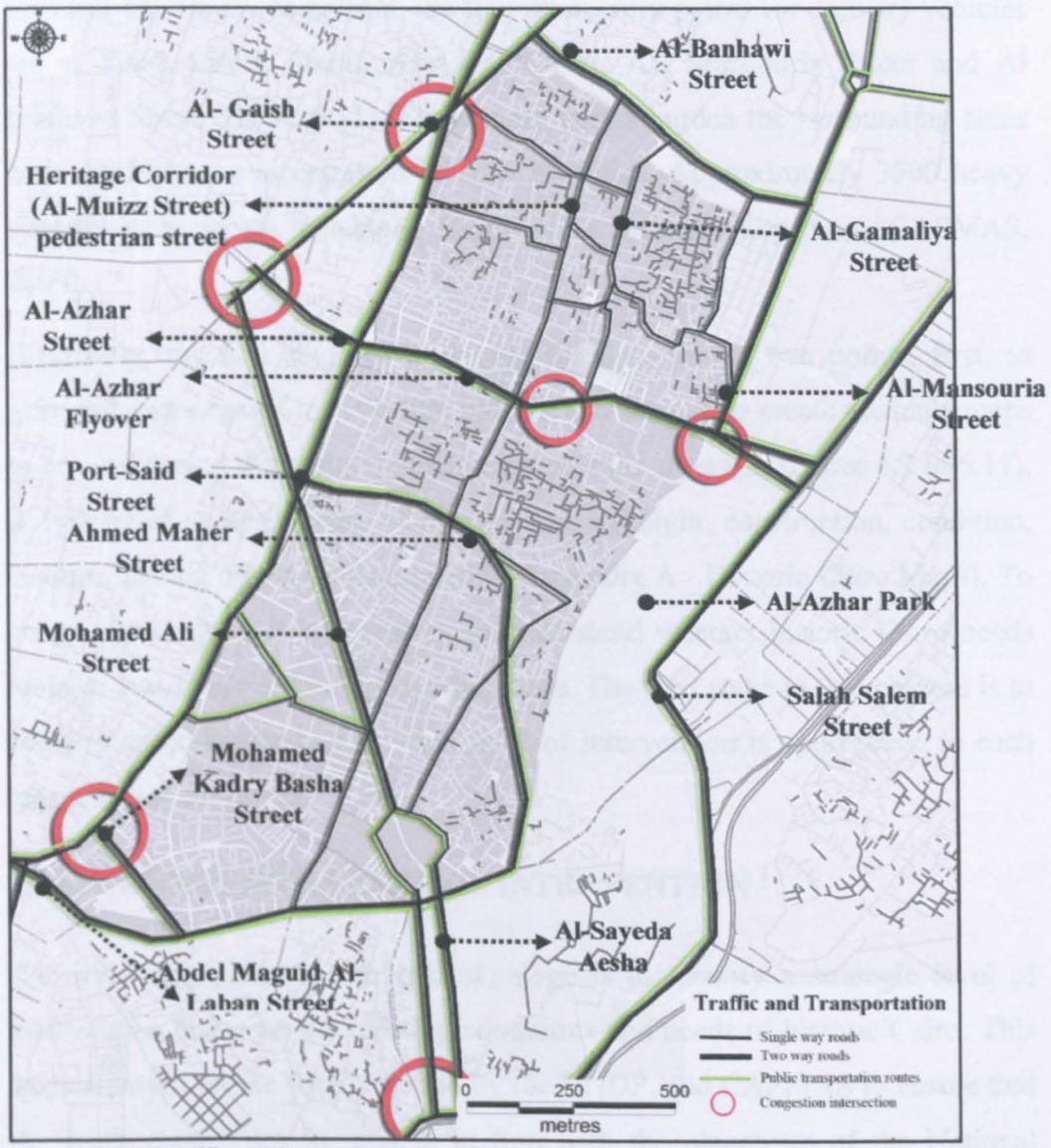


Figure 6.11 Traffic and transportation analysis in historic Cairo (Source: adapted from UNDP & SCA, 1997)

Furthermore, the historic centre suffers from severe shortage of parking spaces. Parking is largely unregulated on sidewalks and vacant lots, burdening the

remaining historic paths deep inside the urban fabric. Most parking is currently provided on streets. The area is serviced neither by parking lots nor underground or multi-story garages. Despite the fact that the area has a great potential for walking tours for tourists, pedestrian movement is extremely difficult. There are only few safe pedestrian zones, but access to monuments is unclear. Currently, the highest pedestrian flows are observed on Al-Muizz Street (the heritage corridor). In addition, the main causes of both congestion and overextension of the network, particularly after the closure of Al-Muizz Street, are delivery to and pick-up of goods from workshops and handicraft and souvenir boutiques. At present, the four main entry points for delivery vehicles are at Salah Salem Street, Al-Azhar Street, AL Mansouria Street and Al Banhawi Street (figure 6.11). These entry points burden the surrounding areas with the highest concentration of such activities. Approximately 3500 heavy vehicles have access to historic Cairo on an average daily basis (CAPMAS, 2009).

Ultimately, the first stage of analysing the data served two points; first, to inform the strategy of intervention process and second, to create thematic maps to be used during the design guideline process (as shown in figures 6.2 to 6.11). A full set of analysis maps of historic Cairo (height, construction, condition, landuse, among others) is illustrated in Appendix A - Historic Cairo Maps). To generate strategies, it is necessary to understand whether historic Cairo needs more or less intervention and in what ways. The next stage to this process is to develop an understanding of what level of intervention is appropriate to each category and condition.

6.3 SECOND STAGE: LEVEL OF INTERVENTION

The following phase to the analysis stage is to identify a strategic level of intervention based on the existing conditions and needs of historic Cairo. This stage is based on the data provided by the UNDP, and CAPMAS to ensure that the work contributes to, and is in line with the objectives of the National Organization for Urban Harmony (NOUH) and the Ministry of Culture Supreme Council of Antiques (SCA). The intention of the strategies is to provide individual, specific-needs-based responses that create the minimum

disruption while delivering maximum benefit to historic Cairo.

This is performed by first explaining the overall development plan, before proposing the redistribution of uses and activities. The level of intervention is then introduced and illustrated, demonstrating how each urban zone has its specific intervention that relates to the target users, activities, and area identity.

6.3.1 Description of the development plan

The significance of historic Cairo to the local government, Cairo Governorate, is predominantly a potential site of investment in the tourism industry, which can open venues for employment in the area. Nevertheless, the Governorate planning staff lacks awareness of the significance of the architectural and urban value of historic Cairo (AKTC, 2001). However, it is conceded that historic Cairo needs to be civilised through the improvement of its appearance so as to maximise its economic development from tourism (Mohareb, 2009b; Sedky, 2009; UNDP & SCA,1997).

The development plan, with the assistance of space syntax techniques, aims to improve accessibility in historic Cairo, whilst respecting the organic nature of the area's urban fabric. It also aims to link the local structure to the global structure using the minimum intervention to create the required positive impact. This approach will minimise disruptions to the local communities, contribute to improved environments, and reduce intervention costs. The areas for physical intervention should be determined thorough a dialogue with stakeholders of historic Cairo. Many interventions were merely planned to revitalise historic Cairo or its context regardless of the impact on the area's character and meaning from local residents' perceptions (AKTC, 2001). An efficient design not only brings immediate benefits to investors and the local authorities, but also benefits the local residents in the long term (Carmona et al., 2002).

As discussed in chapter 2, the UNDP & SCA (1997) identified five urban zones in historic Cairo which are the Heritage Corridor, the Institutional Corridor, the 19th Century Corridor, the Transformation Zone, and the Community Zone. However, those zones have been defined according to the physical structure of the built environment, activities, building era and

typology without determining the urban development strategy required for each zone. Thus, in this study, the identification of the five urban zones is redefined according to urban uses and activities of each zone necessary to fulfil needs, interests, and aspirations of diverse stakeholders in historic Cairo. The five urban zones augment each other in terms of activities and accessibility links and together form the urban entity of the area as shown in figure 6.12.

As previously asserted, historic Cairo contains 313 listed monuments which are primarily located along the main links of the district: Al-Darb Al-Ahmar, and Gamaliya. These, together with the traditional links (Al Muizz, Al Gamaliya, and Ahmed Maher Streets) form the Heritage Corridor of historic Cairo (as shown in figures 6.12 and 6.13). This heritage corridor lies along the medieval thoroughfare of Al-Muizz Street, with its many valuable listed buildings. Mohamed Ali Street, the 19th Century Corridor, is one of the few streets in historic Cairo with arcades. The priority here is to revive the music industries and stimulate craft activities that promote community development (UNESCO, 2012; Sedky, 2009; UNDP & SCA, 1997).

The Institutional Corridor, which lies along Al-Azhar Street, is the main east-west thoroughfare in historic Cairo and contains the Al-Azhar mosque and university, Al-Azhar Park and Al-Hussein hospital to the east, and the wholesale commercial activities and business offices to the west. This street contains many government and office buildings and it also links historic Cairo with downtown Cairo. The Institutional Corridor contains Al-Azhar Park on its east side which is accessible only from Al-Darb Al-Ahmar neighbourhood or from Salah Salem Street. The only other open space in this corridor is opposite the Al-Azhar mosque and cannot be accessed due to security reasons. Thus, due to limited open space, this corridor would benefit from more public open spaces, road improvements, and investments in commercial facilities, and public amenities. These public open spaces play a great role in historic cities, both as a catalyst for private investments and in enhancing the civic sense of the local community.

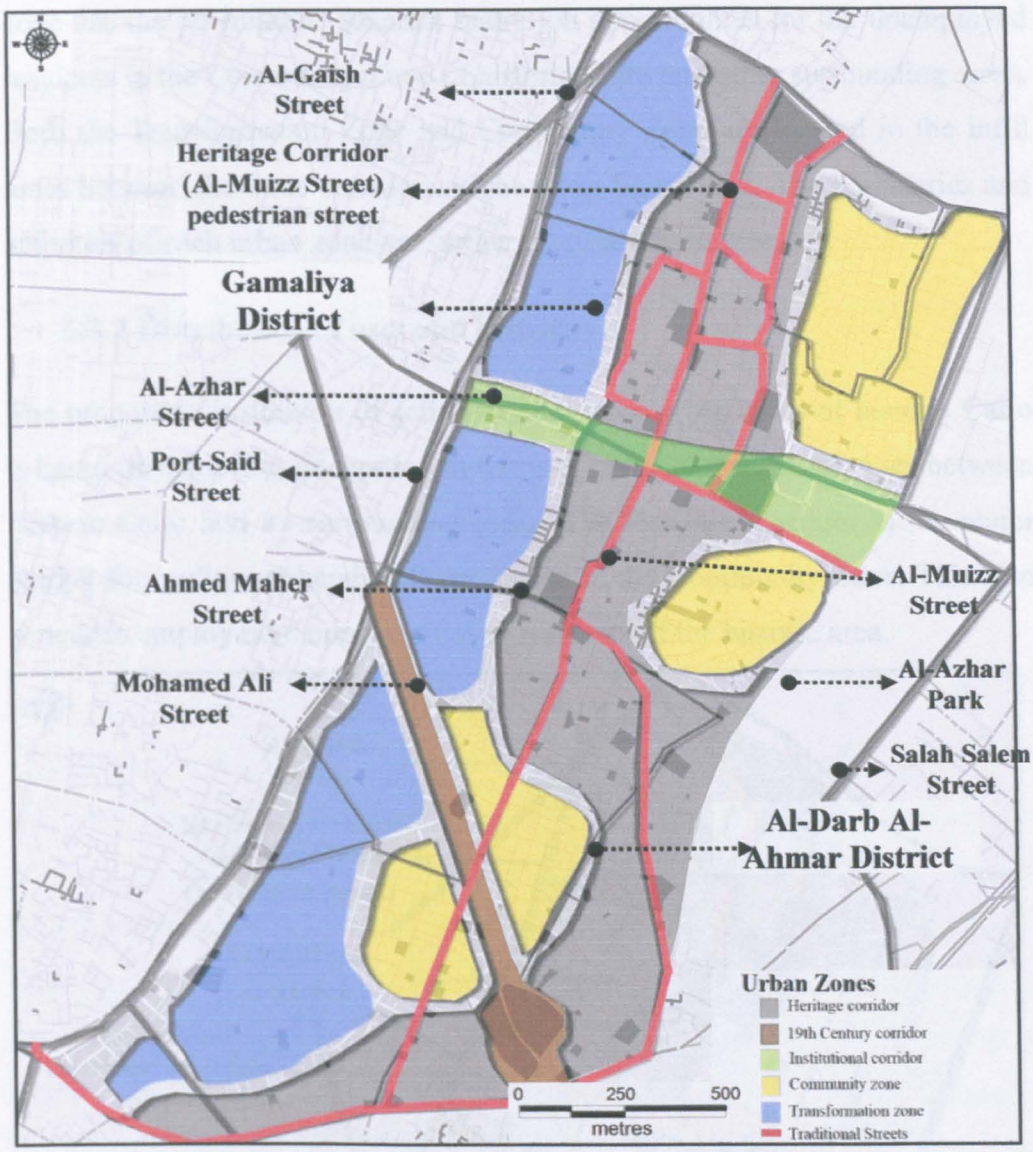


Figure 6.12 Urban zones in historic Cairo (Source: adapted from Sedky, 2009; Sutton & Fahim, 2002; UNDP & SCA, 1997)

As for the Community Zone, it contains commercial handicraft activities and workshops, and social services serving Cairo as a whole. This is the zone that has drastically deteriorated; thus priority for development in this area is housing upgrading and community rehabilitation and empowerment. Finally, the Transformation Zone contains abundant vacant plots (figure 6.12) where private investment developments should be controlled to protect the adjacent pro-community zone. In addition, the Transformation Zone provides facilities such as housing, storage areas, and office spaces for businesses and for entrepreneurs residing in the Heritage Corridor. Moreover, it provides the opportunity for smaller-scale entrepreneurs to start their business in the historic area and to live in middle-income housing in a desirable residential area. This

zone has the potential to generate many job opportunities for the unemployed residents in the Community Zone of historic Cairo and other surrounding areas. Both the Transformation Zone and Community Zone are located in the infill areas between the three corridors as shown in figure 6.12. The boundaries and activities of each urban zone are further discussed in section 6.5.

6.3.2 Distribution of uses and activities

The proposed distribution of activities across the urban areas of historic Cairo is based on achieving integration in terms of complementing activities between historic Cairo and its surrounding areas. The Heritage Corridor is the major market for traditional handicrafts produced in the Community Zone. This also generates employment opportunities to residents of the historic area.

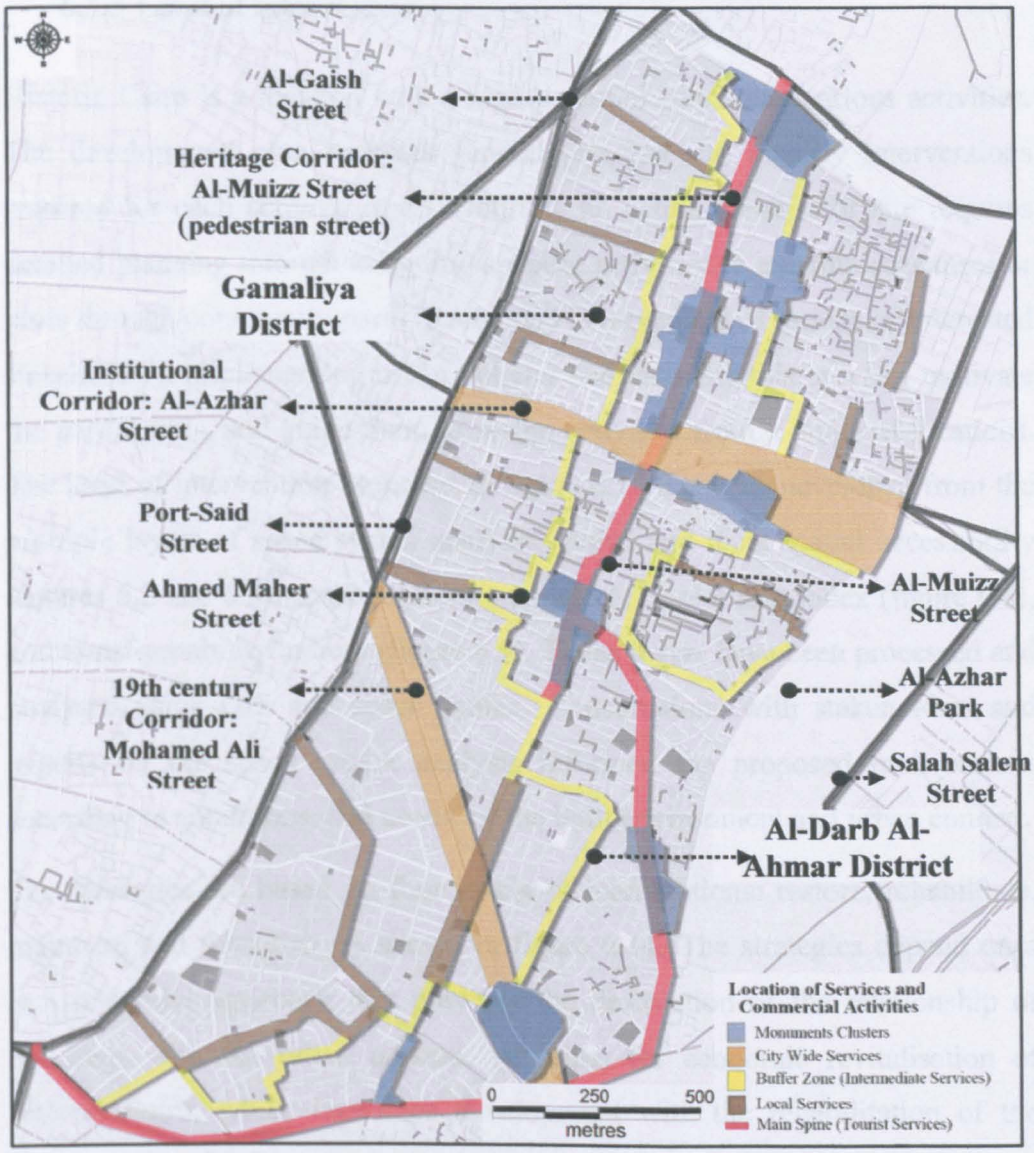


Figure 6.13 Location of Services and Commercial Activities (Source: adapted from

Sedky, 2009; UNDP & SCA, 1997)

Culture-related activities (city-wide services) are located along the 19th Century Corridor and within the Institutional Corridor. These facilities supply surrounding areas with recreational amenities and cultural activities. Intermediate services and shops are located within the two buffer zones which are the areas that link the Heritage Corridor with both Community and Transformation Zones. These buffer zones include schools, youth leisure centres, grocery stores and prayer areas, while the local services and shops are situated within community areas and along public paths. These include health care centres, family planning services, grocery stores, and prayer areas, as shown in figure 6.13.

6.3.3 Level of intervention

Historic Cairo is a location with a high potential to include various activities. The development plan suggests general principles to identify interventions required for each activity group. Defining an actual location or site requires detailed planning through assigning specific activities to existing structures or plots through community participation and involvement of groups of interested stakeholders. Implementing urban policies can facilitate this process, motivate the participants, and guide them to assign activities from a range of locations. The level of intervention proposed in figure 6.14 has been developed from the multiple layers of space syntax analysis; global and local spatial accessibility (figures 6.2 and 6.3), spatial structure (figure 6.7), plot size index (figure 6.8), and transformability indices (figure 6.9). Those layers have been processed and analysed using GIS and space syntax. Consultations with stakeholders and experts on the space syntax analysis informed the proposed interventions according to conditions, and needs, of the built environment and urban context.

The strategies are based on four levels of interventions: restore, rehabilitate, maintain, and demolish, as shown in figure 6.14. The strategies depend on a less restrictive approach that prevents the destruction of the relationship of buildings with the urban context, yet aims for economic revitalisation of historic Cairo, which combines development with the rehabilitation of the existing urban fabric.

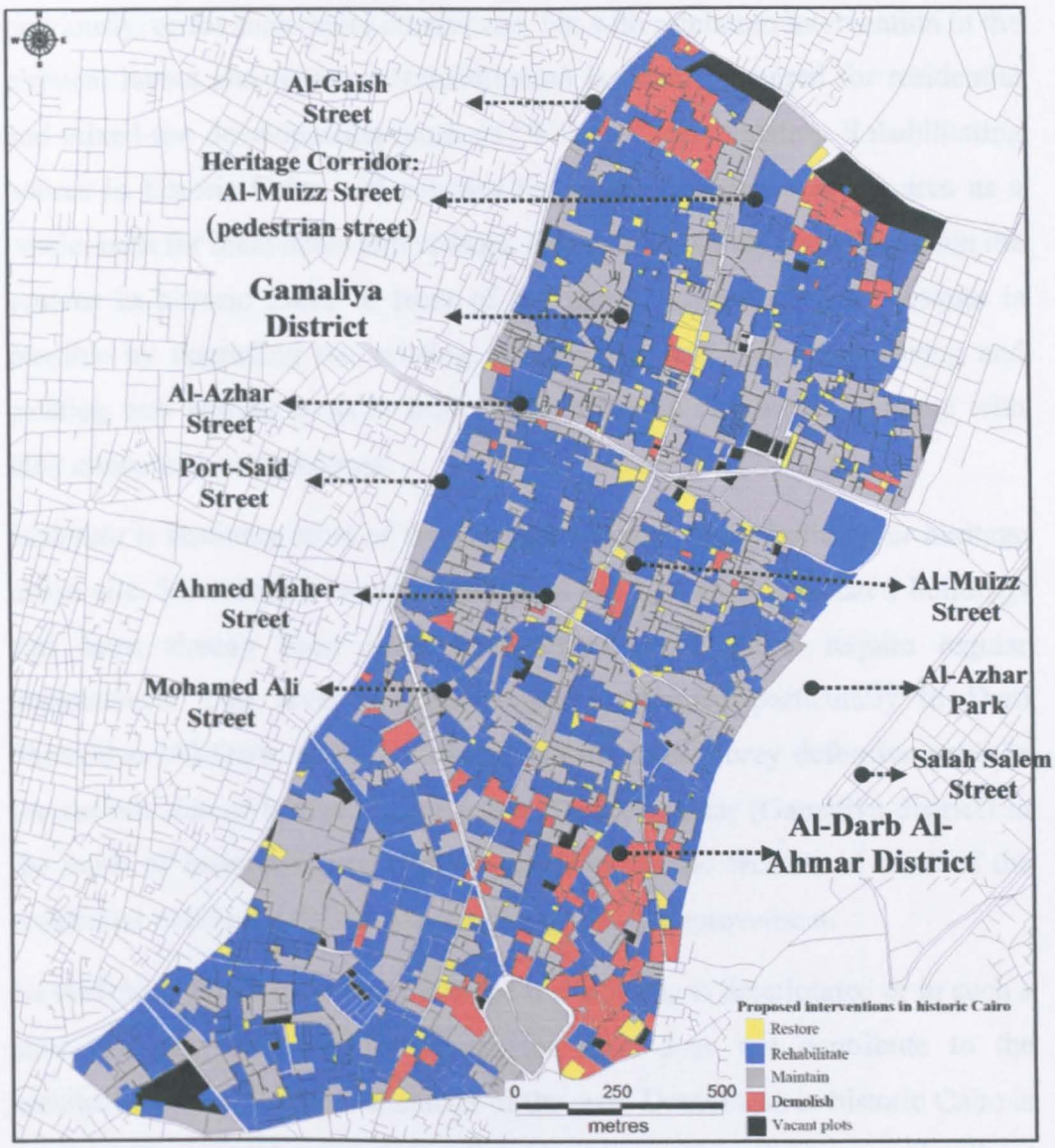


Figure 6.14 Proposed interventions in historic Cairo (Source: the researcher)

Restore is returning the building or the urban fabric to its original state. It is the strongest level of intervention and involves complete rebuilding of one or more element(s). In historic Cairo, restoring historical mosques and their minarets, traditional listed residential housing and monuments is crucial as an immediate positive impact on the quality of the surrounding urban environment and will create a highly valued local community. The monuments, historic buildings, and traditional open spaces need to be restored to integrate and connect with the current multidimensional social and cultural character, particularly in Gamaliya district.

Rehabilitate is a less restrictive approach for dealing with historic fabric as it targets reusing the significant buildings, or the whole area, for the same use as

previously, or for some more current use, but with minimum intervention in the physical layout and features. Rehabilitation is mainly required for residential and mixed-use developments (such as 'Wakalas' and 'Sabils'). Rehabilitating houses in historic Cairo will enhance the visual experience of the area as a whole, both for inhabitants and visitors. Rehabilitating public spaces within the squares in historic Cairo in front of the many monuments and mosques is possible by upgrading the existing infrastructure and pedestrian paving and creating new seating areas in front of the mosques that are in harmony with their contextual surroundings.

Maintain is retaining most of the physical features of the building or heritage urban site. Maintaining is mainly required for historical and listed buildings that have already been restored/rehabilitated but which require regular maintenance. This level of intervention is required particularly in Darb Shoughlan (Al-Darb Al-Ahmar district) in the three-storey defensive gates in the eastern side of historic Cairo and in Darb Al Asfar (Gamaliya district) in the north of historic Cairo. Besides, maintaining the facades of most of the residential buildings will represent a strong visual improvement.

Demolishing would only be considered if a building is deteriorated or in such a state that may cause safety issues, or if it does not contribute to the architectural and historical character of the area. Demolition in historic Cairo is required for ruined/deteriorated, unlisted buildings where their removal will not result in a negative or inappropriate outcome. Such areas are mainly concentrated in the north area of Gamaliya district and in the southeast area of Al-Darb Al-Ahmar and other dispersed plots within its core.

6.4 THIRD STAGE: DESIGN GUIDELINES FOR SUSTAINABLE URBAN DEVELOPMENT IN HISTORIC CAIRO

The third and final stage is proposing the design guidelines. Those design guidelines aim to provide a viable and integrated intervention in historic Cairo that responds to the urban, physical and social context of the area. Stakeholders' consultations, in the form of questionnaires and interviews performed earlier, constitute an important input in this final stage. The design guidelines cover the five urban zones of historic Cairo focusing on the five

design principles; diversity and choice, distinctiveness, users' needs, self-sufficiency, and pollution reduction.

6.4.1 Diversity and choice

Diversity and choice form a main feature in urban design implying mixed uses, providing a hierarchy of services and facilities, and enhancing freedom of choice in movement and in ways people can use their surrounding environment. These affect all scales of the urban environment, from buildings, to spaces and streets, to districts. It has been asserted that while some roads will always been needed, it is crucial to rediscover streets as both social space and as connecting elements within cities associated with the quality of public life (Carmona et al., 2010). Thus, the physical intervention in historic Cairo is not complete until the urban blocks of high transformability index are re-planned, open spaces are designated and the width of the roads are determined.

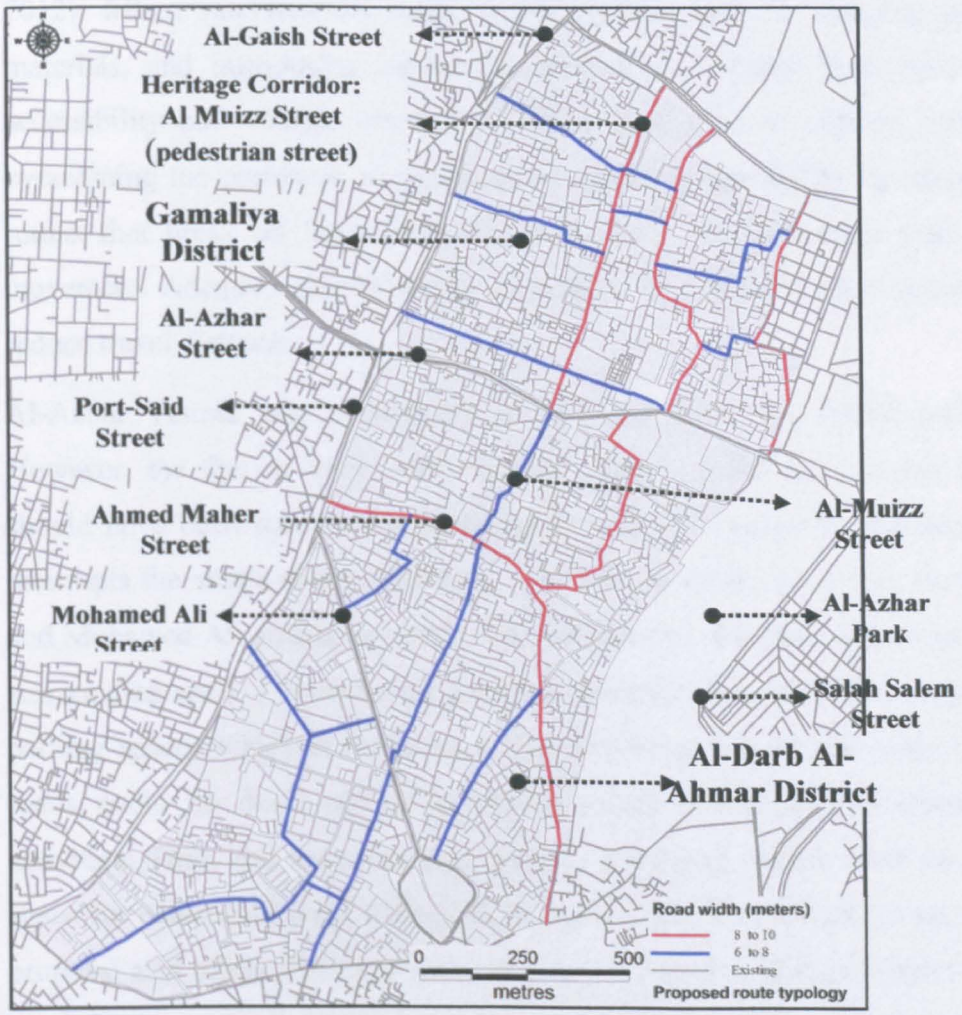


Figure 6.15 Proposed route typology using SSx analysis (Source: the researcher)

The public realm has a key role in integrating historic Cairo with its surroundings and creating a pleasant set of urban spaces. Starting with the streets; a detailed set of street sections covering each route typology have been suggested. Designs were progressed using a set of standard street widths based on a road hierarchy. Street widths have been proposed to respond to their global and local positions within the route structure. These street widths are developed to cover a range of widths and hierarchies from 30 metres arterial roads to 6 metres secondary streets, as illustrated in figure 6.15, and may even reach the minimum of 2-4 metres for tertiary roads.

The width of the road in the traditional town planning normally follows vehicular traffic (UNDP & SCA, 1997). In this study the intention is to create 'streets' which could maximise the interaction between people and the heritage site and improve the public realm. However, streets should not be widened so that they actually destroy relationship of buildings and their context (UNESCO, 2012). Minor interventions could be acceptable, such as changing paving materials, and introducing landscape elements to enhance both pedestrian accessibility and vehicle circulation. There is a need to explore ways of overcoming the problems arising from the lack of permeability by proposing routes that break up large plots that currently form barriers to pedestrian movement. Adequate alternative routes need to be provided when possible to reduce travel distance.

Al-Azhar Tunnel was constructed to partially solve the traffic problem. However, the flyover which cuts through historic Cairo in Al-Azhar Street should have been removed as it represents a major eyesore in this area and interrupts the area's unique character. The arterial roads, Al-Azhar, Port-Said and Mohamed Ali streets, are 30m wide and connect the historic core with the surrounding areas. As previously asserted, historic Cairo suffers from a lack of parking spaces which is the main reason for congested arterial roads. These roads could be developed to combine multiple forms of movement and activities. Thus, this could be achieved by providing shared zones to allow space for parking/drop-off without reducing the number of existing lanes. The proposal also offers planting and/or shading structures within pavement zones to shelter pavements without impeding pedestrian movement, as shown in

figure 6.16.

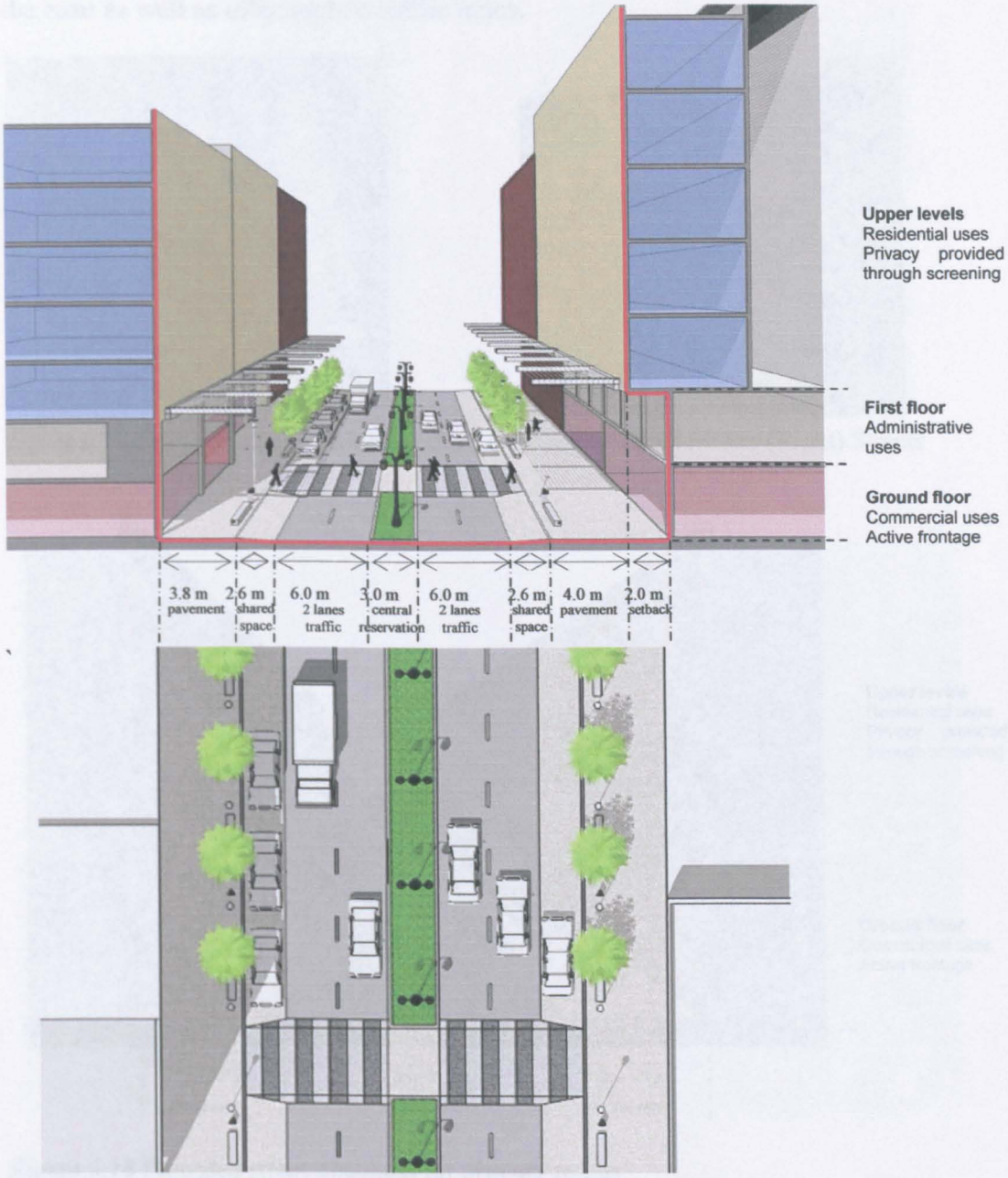


Figure 6.16 Proposed street treatment Al-Azhar Street, Port-Said Street

The primary collector roads, such as Al-Muizz Street (Gamaliya district), Gamaliya Street, and Ahmed Maher Street, are two-way roads for inter-area traffic connecting the various urban zones. These roads are 10 metres wide on average and carry lighter traffic volumes and more local commercial activities. However, they suffer high congestion and lack of parking spaces. Limiting the use of private vehicles and encouraging public transport mini-buses along these streets could reduce the existing problems. Off- street parking may be allowed along certain lanes of these streets. The proposed improvement of these roads

is to provide shared zones to allow space for parking/drop off on one side of the road as well as offering two traffic lanes.

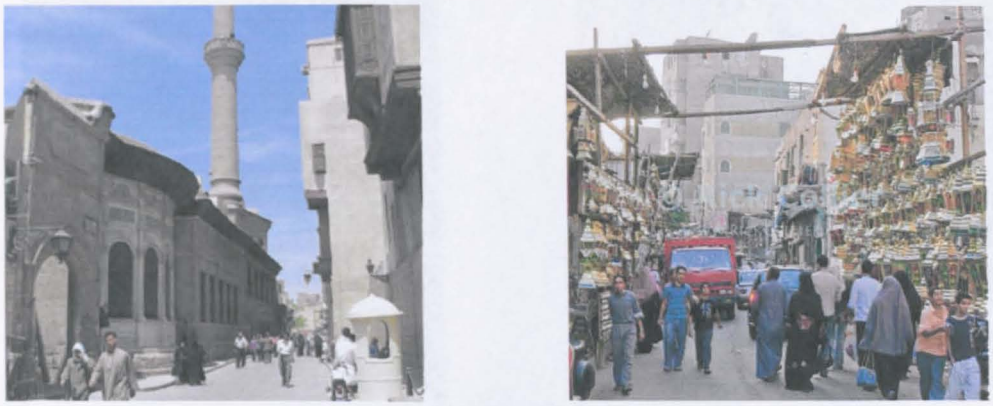


Figure 6.17 Existing status of Mohamed Ali (Left) and Ahmed Maher (Right) Streets

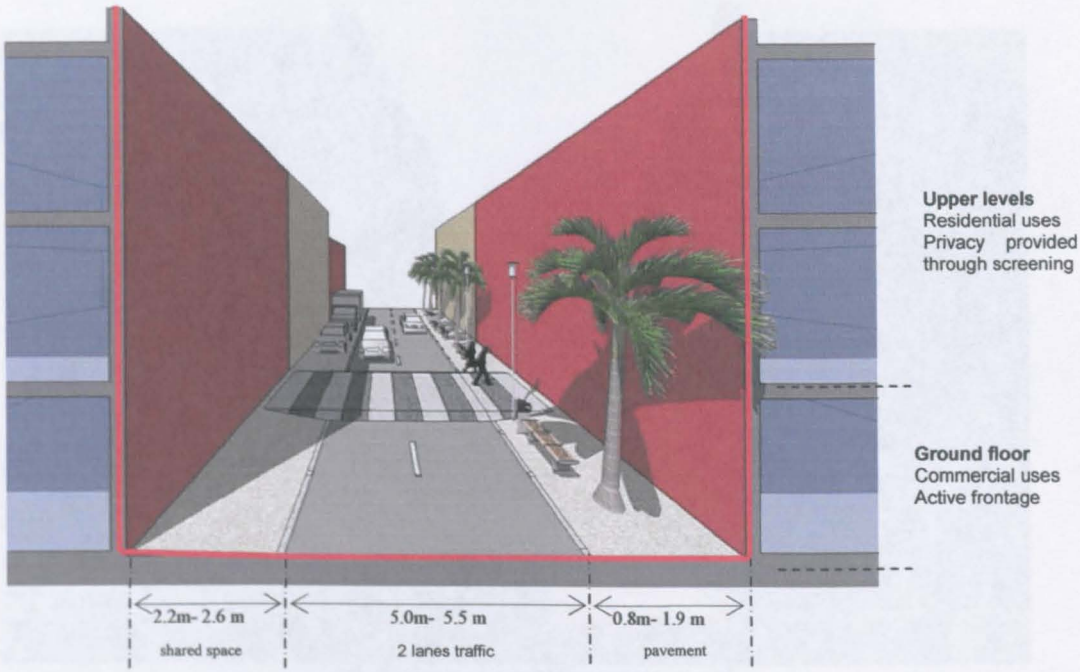


Figure 6.18 Proposed street treatment for primary routes

Secondary roads, such as Bab-al-Wazir Street, Al-Muizz Street (Al-Darb Al-Ahmar district), and Al Moski street carry one-way traffic surrounding the monuments and heritage buildings of historic Cairo. On average they are six metres wide and tend to have low traffic volume.

These streets host local-type retail and should be predominately used as pedestrian routes and/or shared zones, as shown in figure 6.19. The loading and unloading areas serving the heritage corridors could also be linked to these streets. Off-street parking may also be allowed along specific sections of these

streets according to the level of congestion.

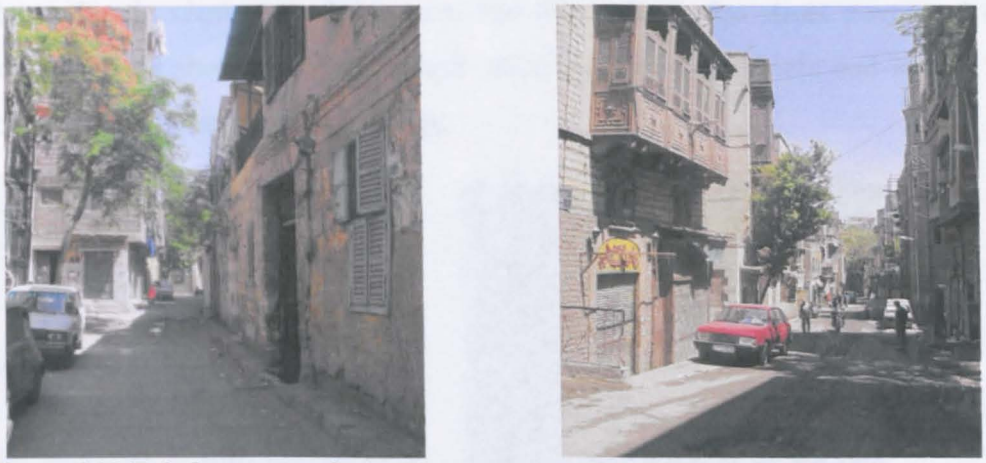


Figure 6.19 Existing status of secondary routes

Figure 6.20 Proposed street treatment for secondary routes illustrating pedestrian and shared spaces

Tertiary roads surround the residential blocks and carry one-way traffic as shown in figure 6.21. This is dictated by the narrow widths of the streets, which are on average four metres wide. It is suggested that for tertiary roads less than three metres wide, they should be replanned and treated to serve as pedestrian routes. Tertiary roads in Darb Shoughlan (Al-Darb Al-Ahmar) opposite to the Azhar Park have been rendered in basalt and granite, as shown in the left hand

side of figure 6.21. However, these major alterations have resulted in loss of the authentic character of the area. For this reason, the street pavement of tertiary roads should be kept simple with traditional materials and stones to exentuate the monument buildings.

Figure 6.21 Existing status of tertiary routes (Left) illustrating the initiative taken by AKCS-E to renovate the inappropriate street pavement rendering in Darb-Al Ahmar. (Right) showing a van dropping off at a carpentry workshop in Gamaliya district (Source: the researcher)

Pedestrian routes are only located along the Heritage Corridor within Gamaliya district. The pedestrian network in historic Cairo should be replanned to provide continuous and direct routes between main destinations and amenities. In such a heritage site, the pedestrian environment should be conducive to walking and should incorporate and encourage diverse public activities where vending and advertising do not hinder accessibility or safety. Moreover, pedestrian networks need to be facilitated alongside car traffic by minimising conflicts with vehicular traffic. Thus, in order to support diversity and choice in this area, removal of barriers and enhancing local accessibility is crucial. Landscaping systems could be developed to create synergies between security and sustainability to help prevent crime and secure site perimeters using environmentally friendly barriers (Coaffee, 2008).

In order to further enhance diversity and choice, it is suggested that integration and permeability are increased by providing a rich mix of uses along the main roads. This may include tourist, art and culture facilities in addition to cafes and restaurants. This concept is to encourage tourists to experience the local heritage, architectural monuments, craft exhibits, and traditional cafes in the

area. This scheme would also encourage local craftsmen and entrepreneurs to upgrade their businesses and provide further tourist facilities. Besides, this would stimulate community interaction through the notion of pleasant and accessible urban spaces within their local community.

Consequently, appropriate proposals for historic Cairo need to provide a high level of accessibility without compromising authentic features of the urban context. Internal traffic should be managed to improve the current situation of traffic congestion, particularly in areas with a high concentration of monuments. Locations of loading and unloading inside and around historic Cairo, serving the various socio-economic activities, should be identified to maintain effective and efficient vehicle circulation.

Moreover, pedestrianising of Al-Azhar and Al-Hussein squares needs to be planned in such a way that these squares combine to form a grand plaza which could serve as the lively heart of historic Cairo, offering visitors and local residents diversity in facilities and services. The rows of shops obscuring the monuments should be relocated from historic Cairo, as some uses are considered incompatible with the character of this heritage site. Furthermore, activities that generate heavy traffic, and which cause hazards, and pollution are considered inappropriate to this heritage site and should be relocated as well.

6.4.2 Distinctiveness/Sense of place

Distinctiveness is mainly concerned with preserving and enhancing what is unique about places. In the case of historic Cairo it can be viewed as constructs of unique geographic, physical, and environmental characteristics combined with unique cultural circumstances and subsequent human interventions over time (Carmona, 2009; Clarke, 2009; EU Working Group on Urban Design for Sustainability, 2004; Rogers, 1997; Bentley et al., 1985). Local residents have to be involved in any aspect of the planning process as they have the strongest claim to their areas; otherwise the sustaining of any conservation scheme is likely to fail (UNESCO, 2012).

Notably, heritage sites play a vital role in developing and maintaining self and group identity of local residents, which further enhances distinctiveness of the area. Place identity is defined as the way in which a place informs the identity of a local resident or a community and the composites of its characteristic features. Thus, the types of place identity have been distinguished based on attitudes of an area's insiders and outsiders. The insideness reflects stronger or deeper place connection; whereas meanings, cultural values, experience, and associated place qualities identified by the visitors are reflected in the setting, in which the more inside a person is the stronger the identity of the place (Shamsuddin & Ujang, 2008). Recently, Al-Muizz Street has offered visitors and locals one of Cairo's most pleasant historical tours with impressive lighting designed by Misr Company for Sound, Light and Cinema (MCSLC) to highlight its beautiful architecture (MCSLC, 2010).

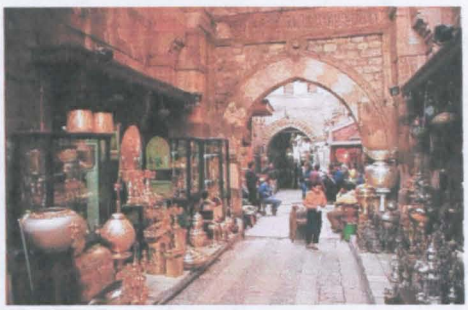


Figure 6.22 The distinctiveness of historic Cairo's open and enclosed spaces which form its unique architectural character (Source: MCSLC, 2010)

Currently, major religious centres at Al Hussein and Al-Azhar mosques as well as Al-Azhar University create a religious and educational comprehensive complex of an exceptional realm. Besides, commercial centres near Al-Azhar and Port-Said Streets and retail markets such as Sagha and Khan Al-Khalili generate a distinctive sense of place. These centres mainly sell jewellery, gifts and souvenirs, perfumes and spices; all adding to the overall experience of historic Cairo. Also, 90% of Al-Muizz Street's shops - particularly those enclosed between Bab-al-Futuh and Al-Azhar Street - are mainly selling hookahs (narghile). These activities need to be integrated with other diverse tourist facilities, such as tourist information centres and traditional art galleries, amongst others.

The character of a quarter is certainly affected by the functional regeneration of the traditional activities as well as the functional restructuring of the area's

economic base. Restructuring entails changing the economic functions within the historic quarter, and may also entail the displacement of existing functions and users. In the case of restructuring or gentrification, building owners and landlords seek to maximise their profits by trying to attract higher-value uses and tenants who are able to pay higher rents. Thus, displacement is sometimes regarded as undesirable because part of an historic quarter's sense of place derives from its functional character (Tiesdell et al., 1996). In the case of historic Cairo, functional regeneration needs to be carefully considered as spontaneous regeneration might affect the area's distinctiveness and unique sense of place. A main aspect of this distinctiveness is the continuity of the original craft workshops, cafes, and bazaars which form the explicit traditional atmosphere of historic Cairo.

New and continuing uses in historic Cairo may necessitate some degree of adaption. The range of acceptable uses is therefore a major consideration for the future of a monument. It requires balancing the economic viability of the range of uses against the effect of change entailed in the architectural and historic interest of the buildings. Regrettably, many listed monuments are being used in a degrading way and are facing vandalism. An example of monuments affected by vandalism is Sabil-Kutub Rukaia Dodo, where its unique wrought iron windows have been detached, and stolen (figure 6.23). This has negatively affected the sense of place and respect for heritage in such an important location in Al-Darb Al-Ahmar.

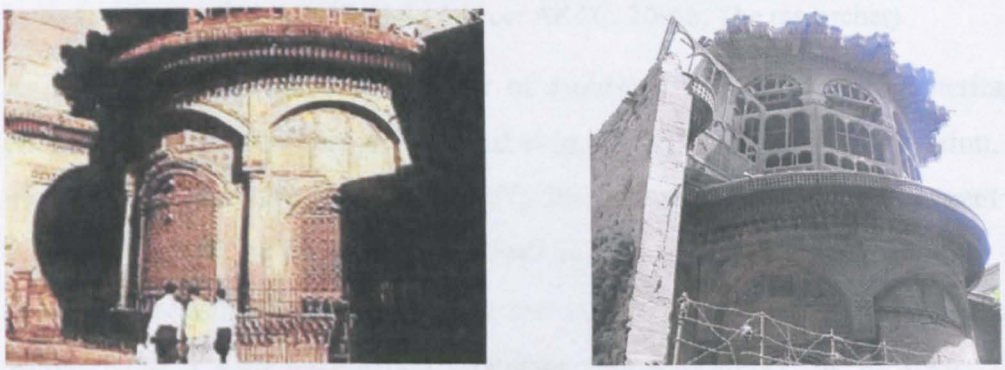


Figure 6.23 (Left) Sabil-Kuttab Rukaia Dodo with its distinctive wrought iron windows. (Right) the monument after vandalism with its windows blocked-up with bricks. (Source: SCA,2002; the researcher)

To ensure appropriate gentrification and adaptation of buildings, in principle, the aim should be to identify the optimum viable use that is compatible with

the fabric, setting, and interior of the historic building. Also, it is vital to ensure the benefit to the local community with minimum disruption to the area's authenticity and distinctiveness. Many of the buildings in the historic city can be restored successfully whilst retaining its original sense of place, and working to the interest of the monument, where possible with compatible uses for community facilities and other local activities.

In order to develop historic Cairo whilst preserving its distinctiveness, concern and efforts need to be directed towards the quarter's economic infrastructure and original urban fabric. This may be done by stimulating economic growth and encouraging better utilisation of the historic building stock. A commercial rationale for investment within this historic quarter must develop. Notably, incentives and public actions may be important factors that drive this investment. Historic Cairo needs to establish its position as a centre of production and consumption; in particular it needs to utilise and exploit its key resources - its historical fabric and sense of place.

Figure 6.24 (Left) Proposed community commercial facilities having the same pattern as the existing ones (Right) (Source: AKTC, 2005b; The researcher)

As almost 60% of the total number of buildings located along the heritage corridor are in poor condition and need either demolition and reconstruction, or major repairs and renovation (UNESCO, 2012; Ouf, 2002), the replacement of buildings should be a stimulus to high-quality design, and an addition or replacement building should respect the overall context as part of a larger whole, with a well established character and appearance of its own. The proposed guidelines suggest that new buildings should adhere to set design standards and guidelines to guarantee the successful blending of new with existing buildings. This will help ensure visual continuity, maintain the overall harmony of the heritage corridor, and preserve the sense of place of this area.

Figure 6.25 (Left) a prototype model for a residential building in historic Cairo using proportions and forms which are compatible with the character of the traditional buildings. (Right) Upgrading of existing residential buildings. (Source: AKTC, 2005b; The researcher)

6.4.3 Users' needs

The basic human needs according to Maslow's hierarchy of needs consist of five levels divided into two main categories. The first four levels are often referred to as deficiency needs or basic needs and it is claimed that if any of these needs are not met, a person would take appropriate action to ensure own satisfaction. Thus, the most basic physiological needs have to be satisfied before progress can be made to the higher-level needs. The top level consists of 'being' needs, which include beauty, meaning, truth, wholeness and justice, among others (Tweed & Sutherland, 2007). However, if the most basic needs of individuals are not met, it will be difficult for them and for the society at large to focus on higher-order collective needs such as sustainability (Carmona et al., 2010). Besides, if human needs are ignored, then it is recognised that social and economic sustainability will unlikely be met in a society.

Carmona et al. (2010) assert that considering the relationship between people and their environment starts with architectural or environmental determinism, where the physical environment has a determining influence on human behaviour. Moreover, people do change the environment around them, just as the environment influences them; thus it is a two-way process. In this process people create and modify spaces; meanwhile they are affected in different ways by those spaces. There are various views towards the degree to which the

environment affects people's actions. It has been suggested that there are several weaknesses of physical design that could be identified. Among these is ignoring the active role of human choice and goals, and neglecting active practices of creating and adapting environments (Carmona et al., 2010; Bianca, 2007). Lynch (1960) explained why a community's perception of its urban surroundings is important by saying: 'Every citizen has had long associations with some part of his city, and his image is soaked in memories and meanings.' Thus, the two-way process between a person and the environment is more complicated than merely providing basic physiological needs. Ensuring the provision of the higher levels in Maslow's pyramid of human needs is a necessity for a community's sustainability, particularly in historic contexts of fragile urban fabric.

The rights of the local community have been emphasised by the international Cultural Tourism Charter; insisting that development or upgrading for any cultural heritage site should aim to alleviate poverty through local training and employment programmes (Sedky, 2009). Reconciling conservation and development is a prerequisite for achieving improvements for local residents in heritage sites as in historic Cairo. In the design guidelines, new functions and activities for the existing monuments are suggested to achieve economic development. Alternatively, the existing uses may remain - but operate more efficiently and profitably (Tiesdell et al., 1996). This could be achieved through the re-use of historic monuments such as Wakalas and Madrassas in historic Cairo. Permanent arts and cultural activities held within these monumental buildings may enrich the local community's sense of belonging by initiating creativity, talents, and inspirations within the local residents and visitors. This will also enhance social interaction between local residents and visitors, thus boosting the spirit of partnership and cohesion within the community members in historic Cairo. In addition, this functional restructuring may well generate revenue which can help fund the maintenance of the buildings and supply facilities and training for the local residents.

There is a high percentage of low education levels among the local residents in historic Cairo, accounting for the high level of unemployment among the workforce. The informal sector is the main labour market in various capacities;

such as metal work, traditional handicrafts, carpentry, and car repair. This offers employment opportunities to unskilled and low-skilled labour. In addition, the residents in historic Cairo aspire to the prospect of being middle class. However, due to the socio-economic decline in Egypt over the last decade, their income is much less than expected, leaving many frustrated, and discontented. Consequently, appropriately planned policies should empower the local community to participate fully in the development of historic Cairo, by providing grants and incentives and by encouraging NGOs and entrepreneurs to provide vocational training programmes and employment opportunities. These programmes could revive and stimulate craft activities that have disappeared due to lack of demand such as stucco windows (a material made of an aggregate, a binder, and water), turned wood, and inlaid marble, thus revitalising the traditional artefacts of this heritage site.

Concerning safety, violent crime is uncommon in historic Cairo (Sims et al., 2003). However, during the last decade, corruption and injustice in addition to the growing gap between social classes, have driven more theft crimes and by implication the general feeling of insecurity in the area. This has also led to an increase in the rate of drug addiction among young adults, as a means of expressing the disappointment and deprivation in their needs (UNESCO, 2012; AKTC, 2001). In the local accessibility choice of historic Cairo illustrated in figure 6.3, it is deduced that occurrence of crime incidents, vandalism and drug abuse tend to occur in segregated areas of historic Cairo, particularly in cul de sacs and vacant and deteriorated plots. Spaces with higher accessibility tend to have lower crime rates, while places with low accessibility have higher crime rates (Hillier & Sahbaz, 2009; Baran et al., 2007). Consequently, the design guidelines recommend combating crime by space redesign and appropriate management. Transforming deteriorated and vacant plots, which constitute 6.1% of the total area of historic Cairo, into public spaces, would enhance surveillance and eyes on the street which would help mitigate crime and vandalism.

6.4.4 Self sufficiency

Patterns of life are difficult to change over the short term; design has an important role to offer stakeholders with the choice to lead more self-sufficient lifestyles in the future. Basically, effective design will require key stakeholders and local residents to have an active involvement in developing a vision for their heritage site. Building a sense of community, involving communities in decision making, and designing cycle and pedestrian networks all form the basis for a community's self sufficiency. Thus, active participation represents a key principle of both self sufficiency and sustainable development (Carmona, 2009; Broome, 2005). It has been claimed that when there is genuine participation, development is more efficient than top-down management on its own. However, it has been argued that a mutual dialogue and partnership is required between public, private, and voluntary stakeholders in order to ensure the successful political decision-making process of heritage sites.

The survey findings in the previous chapter found that 31.8% of the respondents believe the role of NGOs in historic Cairo is not efficient enough, owing to the government restrictions upon the role of NGOs in Egypt. This is because the priority of the government has always been given to the National Security and the continuous renewal of the emergency law (Sedky, 2009). NGOs have always been viewed with suspicion and are not encouraged to participate effectively in community and environmental development; thus most NGOs work cautiously and under many restrictions (Ibrahim, 2001).

Although public participation in the planning processes that precede launching urban development projects in Egypt is not common, consultation initiatives within the community as a main partner could prove effective. Encouraging national banks, international organisations (such as UNDP, AKTC, GIZ, etc) and civic societies to offer loan schemes and financial incentives to encourage the involvement of local communities in development projects could prove worthwhile. Communities could be effectively involved, not only through consultation but also through real participation in decision making and even joint action. From previous similar projects in historic Cairo, funded by the Supreme Council of Antiqueties (Ministry of Culture), the majority of

respondents agreed that they were affected by the decisions taken on their behalf, and that they believed they had the right to be involved in all stages of the planning process.

Regarding the suggested design guidelines, it could be in the best interest of all stakeholders to implement a top-down stream of action coupled with a bottom-up stream. In this process, the broader concerns of development can first be identified by the first stream using the appropriate technical support backed up with sufficient community contribution and participation. It has been suggested by UNDP (1997) that to achieve this mutual partnership, a two-tiered structure may be proposed. An advisory committee would be responsible for setting the general policies, following a development plan. Also, a robust, technical planning unit should be responsible for liaising with the community needs and aspirations and transforming them into conceptual plans of action. In order to achieve this successful mechanism, proposed policies should be already prepared as the focus of an arranged participation exercise (focus groups, urban futures, games and so on). Professional expertise may be used to coordinate and interpret community expectations and ensure that conflict of interest between various stakeholders is avoided.

On the other hand, bottom-up approaches should influence the political decision-making processes from the grassroots level in response to threats or opportunities. However, a community may often be concerned over any change in its own environment and may even obstruct well planned development plans due to their concerns and fears. Thus, raising awareness within the community about the importance of active participation for sustainable urban development should be a priority. This could be effectuated by education and information campaigns that target different stakeholders using different tools and instruments. Engaging and informing the community could make use of a variety of techniques; information leaflets, questionnaires, advertising public meetings, charrettes, ongoing forums and training events. This approach should be more targeted to those residents and representatives of the different stakeholder groups interested in participating in the decision-making process. Providing leeway and flexibility in the participation mechanism will definitely build the sense of community and promote local autonomy.

Ultimately, designing cycle and pedestrian networks is one other vital aspect of self-sufficiency within communities. The city of Greater Cairo suffers the lack of sidewalks, construction of sidewalks too close to streets and roads, and lack of maintenance which often discourages people from walking. Moreover, due to the high building and population densities in historic Cairo, the pedestrian routes are often discontinuous and disjointed, preventing some people from reaching their destinations. Another common problem in the pedestrian route network is traffic conflict which causes pedestrians real or perceived danger from fast-moving vehicles.

6.4.5 Pollution reduction

In principle, pollution reduction in urban areas plays a vital role in improving the quality of life, hence enhancing the communities' well-being (Carmona et al., 2010; Clarke, 2009). Some forms of pollution constitute the most negative perception in heritage sites such as solid waste and debris, noise, air and visual pollution, thus repelling residents of and visitors to these areas (UNESCO, 2012). Historic Cairo has been suffering from all the previously mentioned sources of pollution for decades, which has put it in a critical situation regarding how properly its cultural heritage wealth is being preserved. Craft-making workshops are incorporated into residential areas along with small-scale manufacturing industries, including metal welding, aluminium and copper smelting, timber yards, marble cutting and car repair yards. Solid waste and debris are widespread on the streets, on vacant plots, and around the ruins. At present there is no systematic solid waste collection in the area.

As described earlier, these strategies are based on what is missing or underperforming in historic Cairo, using the proposed interventions to allow historic Cairo to improve and develop its existing status. The strategies also incorporate eliminating activities that are undesirable, whilst enhancing the physical structure of historic Cairo. Examples of undesirable activities to be eliminated are the methods of illumination, eclectic patterns of pavements and shop signs, and inappropriate methods of advertising which adversely affect the visual and aesthetic perception of the heritage site. The strategy also aims to displace most unsuitable and unhealthy activities that are not compatible with

this heritage site such as polluting workshops that do not enrich the authenticity of this site (such as metal welding, car repairing and marble cutting among others). As for enhancing and improving the physical structure of historic Cairo, this involves improving the infrastructure, rehabilitation of urban historic fabric and demolition of deteriorated buildings.

Moreover, the survey described in the previous chapter shows that solid waste and debris are the most dominant type of pollution that most affects residents and visitors in historic Cairo, with 59.1% of the respondents agreeing with that. Noise pollution comes next with 57.6%, followed by 47.7% for potable water pollution. Finally, respondents have chosen air pollution, followed by visual pollution which comes at the end of the sources of pollution that negatively affect the people in historic Cairo.

In order to deal with the previously mentioned destructive sources of pollution, the design guidelines suggest launching waste recycle campaigns to radically reduce the amount of un-discarded solid waste and debris. This could be initiated by NGOs, such as the Sustainable Development Association for Gamaliya (SDAG) which has been focusing its projects on controlling solid waste collection but needs much more community and government support. Recycling points should be designed-in within each neighbourhood in historic Cairo, and recycled waste should be regularly collected by the Cairo Beautification and Cleanliness Authority (CBCA). NGOs should also recruit unemployed youth in the local community to remove workshop and commercial wastes on a fee basis, either manually or using small trucks. The Government along with NGOs are required to raise awareness in the local community of historic Cairo of the danger of waste and debris in its effect on both public health and the heritage context they live in. These bodies should also highlight the importance of preserving and maintaining this area, which attracts millions of locals and tourists every year and generates significant income at both the local and national levels.

Regarding noise and air pollution, firstly, noise pollutants need to be eliminated as much as possible, before secondly, considering means of lowering air pollution. As the residents have suggested, from the previous survey analysis in chapter 5, noisy craft workshops, such as metal welding, car repairing, marble

cutting, timber yards, and workshops, among others, need to be removed and reallocated in a designed workshop complex that gathers them all in an industrial zone further away from this heritage site and residential zones. It would be more rational to replace them with the traditional crafts that have disappeared (for example, brass and copper artisans, stucco windows, and turned wood) as these handicrafts form the original sense of place in historic Cairo.

Another major cause of noise is the consistent traffic congestion and chaos, resulting in continuous, discordant sounds. This has been highlighted by the traffic and transportation analysis in historic Cairo as shown in figure 6.15. There is a diversity of vehicles being used for transportation within historic Cairo; bicycles, carts, motor cycles, taxis, private cars, loading vans and trucks, and buses (ranging from microbuses to coaches) all of which struggle to get to their destinations. Prioritising the development of the transport infrastructure in this area is crucial to respond to the economic pressures and in turn increase mobility and accessibility. CAPMAS (2009) estimated that 100,500 vehicles passed through historic Cairo daily (mainly on Al-Azhar Street). Obviously, this number has increased since these figures were published (2009); therefore in order to reduce reliance on private car use, an efficient public transport system needs to be well planned. Thus, an effective tool to reduce the use of private vehicles is to impose a congestion charge for access through Al-Azhar Street during daytime; which will also generate income towards the renovation and maintenance of historic Cairo. Consequently, reducing air pollution and raising the quality of life for residents, as well as improving the accessibility of disadvantaged groups to employment opportunities and services will help sustain the heritage area. Although the government agencies have been working on improving the sewage and trash collection infrastructure recently, many problems appear to be hindering those initiatives. Lack of funds, complex bureaucracy, conflict of interests, institutional vagueness, and lack of long-term planning are a few of those problems (Aslan, 2006).

6.5 DISCUSSION: SUSTAINABLE URBAN DEVELOPMENT STRATEGY IN HISTORIC CAIRO

The first two stages of the strategy for sustainable urban development of historic Cairo, analysis and level of intervention, together formed a basis for the third and final stage, the proposition of design guidelines. This proposition is based on the design principles prioritised for an effective intervention in historic Cairo. In response to the aim of the study; to propose design guidelines for sustainable urban development of historic Cairo, taking into account stakeholders' views and aspirations extracted from the survey performed, this section concludes with the strategy proposed for the five urban zones. Each zone is unique in its identity, problems, and requirements. Through the first stage of analysis, problems have been defined; subsequently the level of intervention has been identified in the second stage of the strategy. In the final stage, design guidelines that respond to the problems defined and intervention required for each urban zone are developed. The main participants needed for the intervention, besides the target groups of each zone, are identified and their roles defined. This is further explained in the following sub-sections and in table 6.1 which summarises and highlights the sustainable urban development strategy proposed for historic Cairo.

6.5.1 The Heritage Corridor

The Heritage Corridor extends across the whole of historic Cairo from the north at Bab Al Futuh and Bab Al Nasr to the south at the Mosque of Sultan Hassan, penetrating the Gamaliya and Al-Darb Al-Ahmar districts through Al-Muizz Street's historic thoroughfare. It comprises the pre-modern urban fabric, where the anchors and street patterns that emerged prior to the nineteenth century have been preserved. The Heritage Corridor mainly includes most of the valuable listed buildings and monuments in historic Cairo. It also includes other diverse activities; museums, souvenir shops, culture centres, book stores, and traditional cafes and restaurants.

The suggested intervention would be to restore all monuments and listed buildings that are deteriorated or in poor conditions. Re-use of existing monuments, for example Wakalas, and transforming deteriorated and vacant

plots to hotels, inns and cultural centres should be encouraged to revitalise the economic situation. The restoration and adaptive re-use of monuments and listed buildings can increase the revenues of both public and private sectors. In addition, total demolitions, partial demolitions, or reconstruction works should only be allowed for non-listed buildings that do not contribute to the historical architectural character and where its removal results in a more positive visual experience of the site. There is also a need to provide and modify mixed uses within buildings that are compatible with the authenticity of the Corridor, meanwhile retaining the original historic urban context when planning new buildings and developments.

Land use measures, though, need to be further enforced to avoid activities that degrade the liveability of the urban fabric, such as large-scale or polluting industries and wholesale activities, among others. In the case of reconstruction, building heights should not exceed the height of the pre-existing buildings, and residential buildings should not be entirely transformed for commercial, craft, industrial, or warehouse activities; and vice versa, except following the approval of the SCA and NOUH. NGOs might play an active role in encouraging the use of recycling facilities and recruit labour for solid waste collecting.

Moreover, new street cuts and widening in the Heritage Corridor needs to be kept at a minimum to improve vehicular traffic except for minor interventions to improve pedestrian accessibility and mobility. Designing for pedestrians by removing barriers to local accessibility is crucial to bring economic benefits to local communities as well as utilities for visitors and tourists. Relocating traffic-generating activities to the periphery of historic Cairo while imposing congestion charges for parking and entry fees in the Heritage Corridor should be activated for on-street parking and along all congested streets. In addition, promoting the use of non-motorised transportation for goods during late night hours when there is relatively less flow of tourists and visitors could also be considered a viable solution to the problem.

The role of the responsible bodies that issue building permits and monitor the historic buildings and monuments should not be underestimated. SCA should provide more technical and management support to historic Cairo

communities. Coordination is required between all concerned authorities; SCA, NOUH, Ministry of Awqaf (religious endowment) , GOPP, CG, MOHUUD, and international organisations (such as UNDP, AKCS-E) to create an official body dedicated to monitoring and controlling planning activities in historic Cairo, and responsible for imposing strict protection measures and policies. NGOs need to establish joint ventures with the private sector to develop training centres that support heritage awareness programmes for local residents and youth. Shop owners are another important group to participate as they would directly benefit economically from any intervention that might impact on their commercial activities. Thus, involving this group as active stakeholders would prove worthwhile.

Community members need to be considered the supporters and bearers of the area's tangible and intangible heritage; thus they should be actively involved in the process of socially and functionally protecting their cultural heritage. Community stakeholders of the Heritage Corridor include local residents, craftsmen, local businesses, and youth.

Tourists and visitors are mainly interested in experiencing fascinating and pleasant journeys in such unique heritage sites and capturing the historic glimpses within. Thus, it is important to raise awareness of independent tourists (Egyptians and foreigners) and tourism service providers of historic Cairo as a whole urban site rather than just a few isolated touristic venues along the Heritage Corridor, as well as raising awareness of other districts in the area.

6.5.2 The 19th Century Corridor

The 19th Century Corridor extends across Mohamed Ali Street from the north east to south west (to the Mosque of Sultan Hassan) thoroughfare in historic Cairo. The map of historic Cairo marks Mohamed Ali Street as its northeastern gate. This is one of the few streets in historic Cairo with some French-style arched arcades lining several sections of it.

During the late nineteenth century and early twentieth century, Mohamed Ali Street was home to Egypt and the Arab world's most prominent musicians, dancers and instrument makers. It has been well known as a street modelled

after the renowned boulevards in Paris. The 19th Century Corridor mainly houses musical instrument shops, art galleries, cafes, and restaurants. Unfortunately, due to the recent economic instability and uncontrolled urban sprawl, those shops have started to disappear.

The heritage values of the 19th Century Corridor are threatened by a disjointed renovation process, physical deterioration, and heavy vehicular traffic. The latter represents a source of atmospheric, acoustic, and visual pollution that also hinders the visibility of the numerous architectural and spatial historical features of the property area. Encouraging house owners and developers to invest in rehabilitating the nineteenth-century buildings by offering subsidies for construction materials and maintenance works would help protect the character of this Corridor. The efficiency of the road network (widening the road links when necessary or appropriate) and use of vacant plots whenever permitted as open spaces or street parking areas and allocating appropriate sites for underground or multi-storey parking are all viable solutions to the existing problems.

New buildings need to be constructed in the vacant/deteriorated plots of this Corridor (particularly Mohamed Ali and Clot Bey Streets) to a maximum height of four storeys to be homogenous with the authentic character of the area's urban fabric. Existing landmarks (such as the Mosque of Sultan Hassan) need to be emphasised to enhance legibility of the Corridor, i.e. rendering facades and pavements that lead to those landmarks. In addition, encouraging the rehabilitation of non-listed buildings through facilitating mortgage financing and providing technical assistance to building owners and tenants to support maintaining their buildings need to be considered by the responsible bodies.

The involvement of governmental authorities, such as SCA, MoC, NOUH, GOPP, and MOHUUD, is fundamental to raising awareness of and protecting the 19th Century Corridor. There is also a crucial need for the participation of independent professionals (artists, cultural and technical experts, architects, writers, historians, and painters) to form technical conservation groups to support the rehabilitation of historic Cairo through special events, workshops, and awareness seminars. Architectural and construction guidelines should be

planned and reviewed by NOUH and SCA in partnership with the Cairo Governorate, taking into consideration building heights, techniques and materials that should be used in all interventions. Community members' participation is vital for protecting historic Cairo's outstanding value; by expressing their needs in the rehabilitation process and renovation process of their houses. Strong educational tools are vital to enable emerging generations and women to participate in heritage conservation, and be made aware of the threats that endanger cultural heritage.

Tourists and visitors are to be considered the main target groups in the 19th Century Corridor due to it being one of the acknowledged touristic destinations in historic Cairo. The local residents would also benefit at all levels through more touristic and commercial activities.

6.5.3 The Institutional Corridor

The Institutional Corridor extends across Al-Azhar Street from the east of historic Cairo at Port-Said Street to the west at Al-Azhar Park, splitting historic Cairo into Gamaliya and Al-Darb Al-Ahmar districts, and linking historic Cairo with the downtown area of Cairo. This Corridor includes the urban fabric that mainly developed between the nineteenth century and early twentieth century, reflecting the cosmopolitan character of modern Cairo. Al-Azhar Street represents a spatial and functional transition between the pre-modern city and downtown Cairo, with monuments and buildings of architectural interest (Al-Azhar Mosque, Sultan Al-Ghuri Complex), characterised by mixed-use building typologies and the presence of commercial activities along its main spines.

The Institutional Corridor provides educational, health and commercial amenities for historic Cairo and Greater Cairo. Al-Azhar University, Al-Hussein hospital, the wholesale commercial activities, and business offices, significant mosques, cultural centres, public facilities, and Al-Azhar Park are some of the significant amenities in the Corridor, which also includes some relevantly significant buildings representing different architectural values, with a range of residential and mixed-use typologies.

Tourist motels could be planned in new buildings or reconstructions of ruins and vacant plots. Facade rendering along Al-Azhar Street needs maintenance to enhance the identity of the corridor. New building heights should not exceed the height of buildings listed by SCA and NOUH for a flowing skyline. Existing industrial and wholesale structures can be transformed into craft, retail, or service structures. New industrial and wholesale activities should not be allowed on the main spine of Al-Azhar Street. In addition, upgrading the infrastructure, as well as the renovation of residential houses, shops and upgrading of open spaces in the area would be beneficial.

The street network and public transportation need major re-planning, and congestion charges need to be introduced for private vehicles to restrict vehicle traffic and ease up pedestrian circulation. The pedestrian network in Al-Azhar Street should be re-planned to improve accessibility between main destinations and amenities besides designing for walking and cycling in shared spaces. Al-Azhar and Al-Muizz Streets could be merged to form a pedestrian zone which could serve as the lively heart of historic Cairo offering visitors, tourists, and local residents diversity in facilities and sense of place, besides higher customer exposure to heritage sites and retail stores. Thus, protocols of agreement are required between the Ministry of Transport (MoT), Cairo Governorate, and developers to pedestrianise Al-Azhar Street.

The involvement of governmental authorities, such as CG, MoC, and MOHUUD, MoT is crucial both to raise awareness of the significance of intervention projects and to preserve historic Cairo. Al-Azhar University can raise awareness of the vital need for protection of cultural heritage through programmes and events.

It is important to involve youth and students of Al-Azhar University and to make them aware of their role in the maintenance and preservation of this heritage site. Community members should also be invited to take part in focus group discussions to share views, ideas, and aspirations for improving the Institutional Corridor and attracting more tourists to the area.

6.5.4 The Community Zone

The Community Zone is located in the north eastern gate of historic Cairo and around Mohamed Ali Street (19th Century Corridor). It connects the Heritage Corridor with other residential areas of Cairo. The Community Zone comprises mainly buildings in various states of decline. This zone incorporates housing for low-income families, business offices and storage facilities (on ground floors), in addition to health care and family planning, traditional handicrafts, grocery stores and childcare facilities and schools.

Rehabilitation of non-listed buildings is required, and building owners and tenants should be encouraged to maintain their facades according to strict regulations in terms of materials and colours to improve the image of the neighbourhoods. For this specific zone, where the major users are children, youth and women, providing safety for pedestrians and cyclists by reducing pedestrian/vehicle conflict, re-planning street networks, and improving public transportation networks is vital. Due to the lack of parking facilities, defined parking lots could be allowed on empty plots that do not affect the heritage value of the area.

In addition, relocating noisy and hazardous workshops to further non-residential blocks and replacing them with more community facilities would benefit the existing communities. Extensions to existing buildings should be kept to a minimum and should only be approved by NOUH and SCA. As for vacant plots, incentives should be provided to encourage developers to invest in new building facades with qualities sympathetic to the character of historic Cairo. There is also a pressing need to introduce mixed-use developments in segregated neighbourhoods to enhance surveillance and reduce crime and vandalism. As for the infrastructure, providing an efficient and sustainable solid waste collection system is required, which progressively covers the Community Zone. This could also be implemented by introducing a combined system of waste collection and street cleaning.

The Social Fund for Development (SFD) with support from the Cairo Governorate, the SCA and NGOs, should be involved to develop a series of projects combining social and economic initiatives in the Community Zone.

SFD, MOHUUD, and SCA could encourage residents to rehabilitate and maintain their buildings through facilitating mortgage financing and providing technical assistance. CG and AKCS-E need to allocate grants and encourage NGOs to organise training programmes for traditional handicraft in order to improve skills and alleviate unemployment of local residents.

Community members, low-income residents, workers, and youth are potentially the main beneficiaries in the Community Zone, and thus need to be made aware of all intervention projects that influence the area. This will strengthen the ties of residents to historic Cairo and emphasise their role in the maintenance and preservation of the site.

6.5.5 The Transformation Zone

The Transformation Zone is situated opposite the Community Zone, extending along the western side of historic Cairo. The Transformation Zone connects the Heritage Corridor with downtown Cairo in terms of land uses, transportation links, and the visual hierarchy of the urban and architectural character. The Transformation Zone provides the entrepreneurs living or working in historic Cairo with accommodation, office space and storage facilities. It also includes low-income housing for the local communities of this zone.

Restoring monuments without adaptive re-use invites another phase of decay and deterioration. Thus, community activities, commercial uses, and tourist amenities could be introduced as facilities within these buildings to help maintain the built environment heritage currently threatened by deterioration. Restoring monuments only would not help without upgrading deteriorated and poor-condition residential and commercial buildings. In addition, designing with pedestrians in minds by removing barriers to accessibility (for instance, public garden fences), and promoting the use of non-motorised transportation for goods during late night hours where there is a low concentration of tourists and visitors would improve the usability and functionality of the Transformation Zone.

Likewise with the Community Zone, the Cairo Governorate - with the support of MOHUUD and SFD - should offer diverse arrangements for financial funds

and grants to middle-income families within the Transformation Zone to repair and maintain their deteriorated houses. Those responsible bodies are required to enable residents to have access to adequate housing during rehabilitation to encourage people to take part in the rehabilitation process. They should facilitate financing possibly through SFD for unemployed community residents to establish small–scale enterprise and provide training workshops to start t new businesses related to this heritage site. NGOs should also recruit labour for solid waste collecting and street cleaning and raise awareness of the appropriate use of recycling facilities. In addition, in order to generate job opportunities, it would be beneficial for SFD and private developers to invest in small projects in this zone.

Collaboration between the governmental authorities and local residents in the Transformation Zone is essential in order to facilitate any legislative issues that residents may encounter during intervention projects. More effort should be implemented by SCA and NOUH to raise awareness, and tackle negative perceptions of heritage amongst vulnerable groups.

The local community (middle-income residents) is considered the main target group of this zone. Hence, facilitating an enabling environment for the restoration of residential buildings, besides offering training programmes targeting women for initiating small-scale projects, would certainly boost the community welfare in this zone.

Table 6.1 The sustainable urban development strategy in historic Cairo (Source: adapted from UNESCO, 2012; Sedky, 2009; Abu-Lughod, 2007; Bianca, 2007; SCA, 2002; AKTC, 2001; UNDP & SCA, 1997)

Urban Zones	Activities and Area Image	Sustainable Urban Development Strategy			Main Participants in Intervention	Target Groups
		Analysis	Level of Intervention	Design Guidelines		
Heritage Corridor (Traditional lifestyle)	Tourism-related and culture-oriented facilities: Includes a range of activities; monuments, museums, souvenir shops, cultural centres, bookstores, café/restaurants	(Restore all monumental buildings that are deteriorated or in poor condition)	Restore	Provide and modify mixed uses within buildings that suit the authenticity of the corridor. Design for pedestrians, removing barriers to local accessibility. Retain authentic sense of place in new buildings and developments. NGOs encourage using recycle facilities and recruit labour for solid waste collecting. Re-use of existing monuments i.e. Wakalas, and transforming deteriorated and vacant plots to hotels, inns and cultural centres to revitalise the economic situation.	SCA NOUH MOA GOPP MOHUUD Developers CG AKCS-E NGOs UNDP	Tourists Visitors Local residents Youths Tourism service providers
		(Local strategy, concentrate on residential uses, local and intermediate structures)	Rehabilitate			
19th Century Corridor (Modern styles within 19th Century Corridor)	Tourism, art and culture-oriented facilities: Incorporates music stores, art galleries, cafés and restaurants. It also includes housing units and public urban spaces.	(Rebuild all residential and commercial buildings that are deteriorated or in poor condition)	Rehabilitate	Raise the commercial use profile to localise facilities and services. Exploit vacant plots as open spaces to combat privatisation of the public realm. Emphasise existing landmark (Sultan Hassan mosque) to enhance legibility of the corridor, i.e. rendering facades and pavements. Modify street network and public transportation.	NOUH SCA MOC CG Artists GOPP MOHUUD	Tourist Visitors Local residents Youth
		(Increase public space, improve pavement, landscaping and lighting)	Rehabilitate			

Urban Zones	Activities and Area Image	Sustainable Urban Development Strategy			Main Participant in Intervention	Target Groups
		Analysis	Level of Intervention	Design Guidelines		
Institutional Corridor (Contemporary life-style combining old and new)	Area of city-wide public services: Contains Al-Azhar University, significant mosques, cultural centres, banks, post offices and other public facilities (music stores, cafés /restaurants, housing, public urban spaces)	(Provide all utilities to all plots)	Maintain	Modify street network and public transportation and introducing congestion charge for private vehicles. Designing for walking and cycling in shared spaces. Maintain facade rendering along Al-Azhar Street to enhance sense of place.	CG MOC MOHUUD Al-Azhar University MoT Developers	Local residents Youth Visitors Students
Community Zone (Area of low and middle income housing)	Housing, Local services and handicrafts oriented: Incorporates housing for low-income families, business offices, storage facilities on the ground floor, in addition to health care and family planning, grocery stores and childcare facilities and schools. Provision of traditional handicrafts.	Increase public space, widen roads and consolidate plots	Rehabilitate	Enhance safety by reducing pedestrian/vehicle conflict and replanning street networks Transforming deteriorated buildings and noisy workshops to new residential blocks and community facilities. Introduce mixed uses in segregated neighbourhood to increase surveillance against crime and vandalism. Design in recycling facilities to reduce solid waste pollution. NGOs to provide development training to unemployed residents.	CG SFD AKCS-E MOHUUD SCA NGOs Developers Local residents	Low-income residents Unemployed labour
Transformation Zone (Mixed-use development)	Area of tertiary sector activities and residential Includes housing for middle-income families, business offices as well as storage facilities on ground floor.	Rebuild all residential and commercial buildings that are deteriorated or in poor condition	Maintain	Design for pedestrians removing barriers to local accessibility. NGOs encourage using recycle facilities and recruit labour for solid waste collecting. Encourage SFD to invest in small projects to generate job opportunities.	CG MOHUUD SFD Developers NGOs	Middle-income residents

CONCLUSION

The aim of this chapter has been to propose a theoretically informed strategy for sustainable urban development of historic Cairo. This has been performed through a three-stage process; firstly, a detailed spatial analysis method has been applied to select, refine, and analyse the route structure and urban morphology of historic Cairo. It should be noted that all relevant findings from the survey performed in the research to determine and gauge a remarkable sample from historic Cairo have provided significant input with reliable and recent information from the users' experiences in the area.

Secondly, after generating these rigorous studies and analyses, which have provided a rich set of layers, the level of intervention has been developed and consolidated. The five urban areas that historic Cairo is classified into have been identified and the strategy of intervention has been selected based on potentialities and difficulties within each zone. The levels of intervention have been classified into four possible levels of intervention: maintain, restore, rehabilitate, and demolish.

The third stage of the strategy proposes design guidelines which comprise recommendations to deal with the urban context of historic Cairo. Thus, this stage has linked design and analysis through a reiterative process that, assuming the acceptance of the responsible bodies, comprises a range of potential solutions for mitigating problems in historic Cairo. It attempts to develop a rigorous methodology that can inform and shape design and development of such a rich heritage site.

The following chapter forms the concluding section of the study that aims to reflect on the research questions posed and recommends projections for future studies.

CHAPTER SEVEN

CONCLUSION

Chapter Contents

INTRODUCTION

The research rationale is backed up by the recent revolution in Egypt, the 'Lotus Revolution' that began on 25 January 2011, which disputed poverty, unemployment, government corruption, and autocratic governance. For decades, Egyptians have been suffering from neglect throughout the government top-down decisions. This revolution aimed to improve the quality of life of the people by activating a community role in the decision-making process to achieve a better and more prosperous future, with greater dignity and social equity. This major political change was partially due to the neglect of the citizens' voice in the decision-making processes in Egypt. There was a call for the altering of future mechanisms for rehabilitation schemes, where the views, interests, and aspirations of stakeholders would be taken into account. The intention of facilitating the involvement of locals in decision-making is to attain long-term sustainability and stability in political, social, cultural, and urban issues.

The study has attempted to fill a research gap where design and analysis have been linked through an iterative process that, providing the acceptance by the responsible bodies, offers several potential solutions for disrupting problems in historic Cairo. The study has developed a rigorous methodology that can inform and shape design and development of such a rich heritage site. The catalyst of such a process would certainly be the active participation of the local community comprising the stakeholders' groups with a diverse range of needs/aspirations and views.

The research proposed a viable intervention in the heritage context of historic Cairo by suggesting a set of design guidelines. It incorporated the views and aspirations of the residents and stakeholders, aiming to minimise the problems that accumulated due to constant neglect from the government and local authorities. Furthermore, the research identified means and tools for achieving sustainable urban development in historic Cairo. It further investigated how the Egyptian authorities (GOPP, SCA, among others) perceived the involvement of residents in the planning process, and the viability of engaging stakeholders

even in deprived areas. In addition, the research highlighted the fundamental propositions that are required for possible interventions within this particular urban and social context. Space syntax was exploited to analyse the existing status of the urban fabric to help develop the spatial intervention.

The study adopted a mixed methodology with an in-depth case study to involve stakeholders in defining the potentialities and constraints of historic Cairo. The combination of qualitative and quantitative methods provided a basis for exploring how community participation plays a vital role in the success (or failure) of the delivery of a development intervention. The analysed results were to inform decision makers of how best to encourage and incorporate stakeholders' views and participation in interventions implemented in their community. A parallel strategy of inquiry adopted in this research, along with the mixed-method strategy, was 'logical argumentation', which incorporates the application of space syntax analysis in the case study. The outcome is an evidence-based and theoretically informed methodology for sustainable urban development in historic Cairo.

The following sections aim to respond to the research questions posed and project avenues for future research.

7.1 THE NEED FOR SUSTAINABLE URBAN DEVELOPMENT IN HISTORIC CAIRO

Sustainable urban development should be a primary target in conservation and rehabilitation interventions in historical areas. The significance of sustainable conservation encompasses the physical state of the built environment and community, and cultural identity. Conservation interventions in heritage sites should maintain and enhance all aspects of the existing urban fabric including structures, activities, associations, values, and meanings, in order to ensure sustainable outcomes in preserving an area's cultural and historic identity.

Historic cities are considered the major physical repositories of cultural identity and national heritage. International commitment towards preserving and developing heritage sites has increased considerably in the past few decades. Most local authorities, NGOs, and residents of heritage sites face complex

challenges in preserving the physical, social, and cultural structures of their historic contexts that have been growing for centuries, particularly in developing countries. Historic Cairo is uniquely distinguished by its composition. Its strong urban identity is based on the relationships created between monuments, housing, open spaces, winding streets and nodes, and social and religious traditions and rituals. The historic centre is composed of collective heritage, with consecutive historical and spatial agglomerations constructing its current form and wholeness.

Due to rapid urban changes and general decline, however, historic Cairo is currently endangered. Those changes resulted in increasingly poor living conditions, lack of maintenance and infrastructure facilities, and gradual degradation of the original traditional, cultural, and social fabric in historic Cairo. Moreover, the urban policies in Egypt have often failed to provide a clear and strategic approach to developing this heritage site in a way that meets the needs of the local residents. A comprehensive approach is needed for the development and conservation of historic Cairo which is required to improve living conditions of inhabitants who will then maintain the cultural and socio-economic welfare of the site.

Sustainable urban development in heritage sites requires governments, the private sector, and the general public to work in collaboration towards developing interventions for the short- and long-term sustainable outcomes. In order to ensure sustainable urban development in historic Cairo, there needs to be forward-looking and simultaneous prominence on rehabilitating the physical built environment whilst enhancing a clean context, providing essential facilities such as education and health, and ensuring equality of opportunity.

7.2 URBAN DEVELOPMENT CONSTRAINTS TOWARDS SUSTAINABILITY IN HISTORIC CAIRO

The rehabilitation and conservation projects in historic Cairo have been mostly restricted to the restoration of individual monuments by various foreign missions such as UNESCO, ICCROM and AKTC and local heritage societies such as the SCA. More comprehensive efforts at area rehabilitation, either as

master plans or action plans have, to date, not undergone any implementation (Antoniou, 2007; AKTC, 2005b; UNDP & SCA, 1997). These foreign missions have initiated important campaigns and proposals for conservation of neglected monuments and "heritage complex" (Daftary et al., 2010; Steinberg, 1996). Despite considerable enthusiasm, though, the actual results of such campaigns have seemed powerless to make a significant contribution (technically, as well as financially) to improving conditions (UNDP & SCA, 1997). As a result of this limited impact, there is a tremendous shortage of funds for the upkeep and maintenance of government-owned, registered monuments. The Ministry of Awqaf (religious endowment), owner of 90% of the land on which the monuments stand, often finds the maintenance of either registered or unregistered monuments a burden, and may be unable to establish other forms of use or innovative mechanisms for the financing of the required conservation (Abu-Lughod, 2007; SCA, 2002 ; Steinberg, 1996).

Many problems have been highlighted in the survey undertaken for the study, in addition to the researcher's observations. Respondents have shown their awareness of and concern over particular tribulations and have feasible and logical suggestions to overcome them. They focus on congested street networks and absent pedestrian routes. Those problems embody an urgent need for implementing new design guidelines that overcome the problems of movement and circulation. Besides, major sources of pollution have been identified as solid waste and debris, noise, potable water, and air. As congested street networks and pollution together form a destruct and related combination, people have demonstrated openness and flexibility to potential suggestions for resolving those issues. According to the general survey findings, 57.6% of respondents complain about low family income that leads to the decline of the quality of life and well-being. Poor families are often forced to send their children out to work to supplement household income, and child labour is receiving considerable attention in Egypt as a serious social problem.

Of the respondents, 62.9% express their contentment with historic Cairo for different reasons. The distinctiveness and sense of place of the area, its traditional character and historical monuments have shaped the community's

identity and continuity. Community members share a sense of belonging to historic Cairo. This sense of belonging creates a feeling of emotional bond within the larger community; and 65.1% of respondents do not consider historic Cairo as a slum or unplanned area. This indicates that residents are generally satisfied with their context but do require some upgrading. The upgrading of this highly popular area may be considered an efficient starting point enhancing the image of the area, thus attracting visitors and tourists and, more importantly, catering for residents' needs and upgrading their living standards. Problems in the area which reflect people's basic needs for safety and security include overcrowding, lack of infrastructure, poor-quality construction, and bad quality of life. Besides, lack of job opportunities and employment builds on people's social needs of self-esteem.

The survey respondents realise that their community possesses the basic foundation to build self-sufficiency, and this could be key to a sustainable framework. Individuals have reported their willingness to participate in development interventions and to be involved in the early planning stages of interventions. However, the majority agrees that the government policies and bureaucracy obstruct initiatives from individuals and NGOs for development programmes or even consultations.

7.3 SUSTAINABLE URBAN DEVELOPMENT IN HISTORIC CAIRO: THE FUNDAMENTAL DESIGN GUIDELINES FOR VIABLE INTERVENTIONS

The research explores five viable design principles significant to the unique character of the living heritage in historic Cairo. One of the most effective means of achieving and maintaining sustainable development in heritage sites is community empowerment. This approach is both wise and achievable: it is far less costly over time than either abandonment or radical intervention; it actively engages the existing social setting, and will not disrupt or alienate the people concerned. It also keeps the historic fabric of the district alive, thus preserving a significant portion of historic Cairo for future generations.

The principles of sustainable urban development provide a starting point for the study. The survey highlights only the most critical principles required for historic Cairo that stakeholders, experts and professionals, and the researcher have identified. The principles required for the urban development of historic Cairo are as follows; diversity and choice, distinctiveness/sense of place, users' needs, self sufficiency/ participation, and pollution reduction. This is applied to the five urban zones of historic Cairo: the Heritage Corridor, the 19th Century Corridor, the Institutional Corridor, the Transformation Zone, and the Community Zone. The proposed design guidelines are outlined below.

'Diversity and choice' affects all scales of the urban environment, from buildings, to spaces and streets, to districts and settlements. Space syntax has been applied to understand and model the evolution of urban patterns and structures in historic Cairo. It highlighted the integrated and segregated street segments and provided insights to guide the process of developing the proposed interventions. Space syntax technique highlighted the importance of improving accessibility within the Community and Transformation zones as these zones suffer segregation and high volume of traffic. The study suggested that while some roads will always been needed, it is crucial to rediscover streets as both social space and as connecting elements within cities associated with the quality of public life. Thus, the physical interventions in the Community Zone and the Transformation Zone are not complete until the urban blocks of high transformability index are re-planned, open spaces are designated, and the widths of the roads are improved.

'Distinctiveness and sense of place' is mainly concerned with preserving and enhancing what is special about places. In historic Cairo it can be viewed as constructs of unique geographic, physical, and environmental characteristics combined with unique cultural circumstances and subsequent human interventions over time. In order to develop historic Cairo whilst preserving its distinctiveness, concern and efforts need to be directed towards the quarter's economic infrastructure and original urban fabric. This may be done by stimulating economic growth and encouraging better utilisation of the historic building stock. A commercial rationale for investment within this historic

quarter must develop. Incentives and public actions may be important factors that drive this investment. Historic Cairo needs to establish its position as a centre of production and consumption; in particular it needs to utilise and exploit its key resources - its historical fabric and sense of place.

To maintain the distinctiveness of historic Cairo while implementing successful rehabilitation interventions, however, participatory design may be an efficient tool to bring in bottom-up insights alongside top-down perceptions. In historic preservation schemes, local residents and everyday users of the place perceive those schemes as disruptive of their lifestyles and routines, particularly if it affects their livelihoods. They often lack awareness of historic and aesthetic values and appreciation of what they have inherited. On the other hand, the concern of planners and designers is mainly focused on the aesthetic and historic values of the area while overlooking people's needs, thus diminishing the meanings of place for local people. Thus, by participatory design, a balance of interest may be attained between all stakeholders, which will help maintain the area's distinctive sense of place.

Concerning providing for 'human needs', the design guidelines recommend combating crime through space design and management by transforming deteriorated plots into common spaces. This could promote interaction between residents and visitors, thus enhancing a stronger sense of community, besides facilitating mixed uses to provide activity in the segregated areas and increase eyes on the street. In addition, encouraging walking and cycling to enhance surveillance through the isolated street patterns also helps alleviate crime and vandalism. There is also a need to improve safety measures in the area by reducing pedestrian/vehicle conflict, which is the major problem of safety within historic Cairo. This could be accomplished through well-planned shared space for pedestrian movement.

Moreover, by further targeting Maslow's social needs, specifically disseminating the sense of belonging amongst individuals, could be considered an effective means of enhancing sustainability in urban development interventions in an historical context. In a densely populated area, such as historic Cairo, provision for public spaces, amenities and facilities would

particularly help residents of this area to feel more satisfied with their immediate context, thus developing a sense of belongingness and self esteem (Abada, 2008). Instead, the limited and often inaccessible open spaces, in addition to the lack of communal facilities, may aggravate aggressiveness and vandalism which, in turn, reflects on people's attitude towards their community.

The fourth principle required is 'self-sufficiency' where sustainable development requires key stakeholders and local residents to have an active involvement in developing a vision for their heritage site. Self-sufficiency also requires communities to be more actively involved in developing a holistic approach for their locality and ways to manage it. Building a sense of community, involving communities in decision making, and designing cycle and pedestrian networks all form the basis for a community's self-sufficiency. Thus, active participation represents a key principle of both self-sufficiency and sustainable development (Carmona et al., 2010). It has been claimed that when there is genuine participation, development is more efficient than top-down management on its own. By referring to the research survey findings regarding the level of participation preferred by the respondents, 13.2% of the sample prefer to participate financially only, 21.8% wish to participate at the consultation level to state their views and aspirations, while the majority, 65%, choose to participate during the decision-making process. The majority of participants assume that their effective participation would definitely guarantee the broader welfare of stakeholders in historic Cairo.

The Government needs to consider initiating and establishing a clear and well-defined policy for rehabilitation which assigns specific responsibilities to each and every institution involved in heritage sites. Besides, expanding the institutional capacity for managing both national and international resources is crucial. Moreover, it has been suggested that to develop successful institutional structures, a priority would be to build up and support NGOs and volunteer groups (Abada, 2008; SCA, 2002). Also, this could be supported by providing proper training to local residents of the community and encouraging their participation in rehabilitation programmes.

Finally, 'pollution reduction' plays a vital role in improving the quality of life in urban areas. Some forms of pollution constitute the most negative perception in heritage sites such as solid waste and debris, noise, air and visual pollution, thus repelling residents and visitors of these areas. Historic Cairo has been suffering for many decades from all the previously mentioned sources of pollution, which has put it in a critical situation regarding how properly its cultural heritage wealth is being preserved. Craft-making workshops are incorporated into residential areas along with small-scale manufacturing industries, including metal welding, aluminium and copper smelting, timber yards, marble cutting and car repair yards.

In order to deal with the destructive sources of pollution referred to above, the design guidelines suggest launching waste recycle campaigns to radically reduce the amount of solid waste and debris. As the residents suggested in the survey, noisy craft workshops, such as metal welding, car repairing, marble cutting, and timber yards among others need to be removed and relocated in a designed workshop complex that gathers them all in an industrial zone further away from this heritage site and residential areas. It would be more rational to replace them with the traditional crafts that have faded away (brass and copper artisans, stucco windows and turned wood among others) as these handicrafts constitute the 'genius loci' of historic Cairo.

In the final stage of developing design guidelines for achieving sustainable urban development required for each urban zone, the main participants for the intervention, and target groups, are identified and their roles defined. Restoring all monuments and listed buildings besides adaptive re-use of existing monuments has been suggested for the Heritage Corridor zone. Minor changes in street widths and cuts should be sought only to improve vehicular traffic or improve pedestrian circulation routes. Regarding the Institutional Corridor, providing more accommodation facilities for tourists is required besides maintaining the building fabric to enhance the unique architectural style of the corridor. In this zone, which is less sensitive than the Heritage Corridor, the street network and public transportation services need special attention and re-

planning as well as the pedestrian route network. Cycling facilities should also be introduced.

For the Community Zone, which is composed of mostly residential buildings, rehabilitating non-listed buildings and maintaining the building fabric of structures while adhering to stringent building regulations is required. In addition, relocating improper and polluting workshops from this zone would directly benefit the community by replacing these workshops with other essential facilities. Finally, the Transformation Zone requires extending of public access to open spaces and regulating the accessibility of heavy vehicles according to specific schedules when tourist and visitor circulation is lowest. This would improve the usability of this dynamic and important zone.

7.4 THE GOVERNMENT ATTITUDE TOWARDS INVOLVING RESIDENTS IN THE DECISION-MAKING PROCESS

The management system in Egypt is characterised by a centralised dominant role of the central Government with very limited scope for local authorities to have an active role or voice, and obviously an absence of public participation and involvement of NGOs. It has been asserted that NGOs and local communities, who are to be considered major key players in historic areas, have not been referred to in any planning policies for the last 30 years in Egypt (Sedky, 2009; Abada, 2008; Salama, 2000). As a result, a widening gap appears between real-life problems within communities and central government plans and decisions.

The general approach of the local authorities in Egypt is a constrained and relatively narrow perspective that affects planning and financing processes. Community involvement is limited due to the lack of communication channels; moreover, community representatives lack the ability to convince the management in establishing such channels. Moreover, one of the major deficiencies in the Egyptian planning policies is the segregation and lack of communication between Government authorities, particularly between the Ministry of Awqaf/Religious Endowment and the Supreme Council of

Antiquities. Moreover, Egyptian policies lack a holistic long-term vision by focusing on rapid, quick-fix, and thus temporary solutions to minor problems.

There is a crucial need for Government authorities to effectively collaborate and resolve any conflict of interest particularly when developing planning policies regarding developing historic quarters. Policies have often disregarded the advantages of incorporating stakeholders that are already involved in their problematic situations and could very likely offer viable solutions. Ultimately, communities within historic quarters should be given the opportunity to have an active role in the decision-making and implementation processes, rather than excluding community stakeholders from the overall process and them a passive audience rather than active/proactive participants.

Policies need to allow a socio-economic study to initiate effective private investment as an important source of funding. Similarly, continuous liaison between local NGOs active in historic Cairo and local leaders will stimulate community participation, providing feedback to the planning process and establishing a basis for understanding action (UNDP & SCA, 1997). Income should be generated from within the rehabilitation project in order to support the continued involvement of local project staff, other than volunteers, and maintain the sustainability of the project. Moreover, potential sources of income could be provided to the community without being seen as a gift, but rather as remunerated services with a reasonable price. Also, income from re-used historic buildings can be made accessible to local institutions, once they have become well-organised and self-dependent. Another source of funding is the taxes that come from the added value of the commercial enterprise or housing development - an asset which has been produced through collective rehabilitation efforts and which should benefit the local community (AKTC, 2005b). Thus, the development strategy needs to deal with both the urban conservation and preservation of the monuments and significant buildings along with the socio-economic initiatives of the local community. This will guarantee the continuity of the process of the urban conservation without relying on external resources.

The proposed plan has been developed for the management of the historic area to emphasise the emotional, cultural, social, and economic values inherent in the cultural properties. The historic area management plan should include clearly laid-out management procedures and systems, and identification of the responsibilities to avoid multiple supervisions or conflict of decisions and streamline the process of decision making. Besides, to maintain and achieve the sustainability of any rehabilitation project, socio-economic policies need to initiate effective private investment as a source of funding. Income should be generated from a range of sources in order to maintain the rehabilitation projects, promote the community capacity buildings, and support the continued involvement of local project personnel and local institutions.

7.5 MEANS OF INVOLVING COMMUNITY STAKEHOLDERS IN THE DECISION-MAKING PROCESS

If interventions are planned for sustainability, it is essential that the values and practices of communities are fully understood, respected, encouraged, and embedded in development plans. It has often been inferred that heritage protection does not rely only on top-down interventions by government or experts but should also involve local communities, as a bottom-up approach. Thus, participatory development is a prerequisite: communities require a sense of ownership for their heritage and culture which reaffirms their worth as a community.

This study has highlighted the potential of community involvement in playing an effective role in the conservation and development of urban heritage areas in Egypt, if supported by government policies. Community partnership in the decision-making process compensates for the shortcomings of the top-down processes of the Government and local authorities. In essence, community involvement enriches and strengthens initiatives, particularly in sensitive areas such as historic Cairo, where people's support is crucially required to guarantee the success of development interventions.

Communities that practice participation in their built environment serve as catalysts for various conservation projects either in their area or in

neighbouring ones. However, local communities may experience conflicts of interests between themselves, planners, and local authorities. Thus, community stakeholders are often isolated and marginalised from an area's development plan. To resolve this issue, NGOs, or development managers, or local representative leaders can employ different tools and methods strategically to bring in community stakeholder representatives in the planning process. This could help local communities define the priorities, support feasible interventions, and provide a role model for the development schemes in their built heritage.

Consultation and participation have been mentioned as key ingredients of good urban design; by ensuring that urban design meets local needs, and taps into local resources, and that community should be involved in the design, maintenance, and managing projects. Engaging local communities in open dialogues to discuss their visions, aspirations, and expectations for their future provides successful consultation and democracy, leading to self-sufficiency. To stimulate dialogue between different stakeholders, a range of development options and interventions could be presented for community and stakeholder groups to explore and consult on, thus developing a sense of involvement and ownership of any resulting decision. However, it should be noted that not all members of a community would be involved to the same extent, owing to personal capabilities and preferences, among other factors.

Stakeholders' participation can be initiated in cultural heritage centres for two purposes; in the short term, to educate stakeholders and interested parties on fundamental information in order to seek involvement and to efficiently and appropriately incorporate their input in the conservation process. In the long term, it is essential to raise awareness and the sense of stewardship across community members of heritage centres. There needs to be an interaction between the decision-making body and people who want to participate as participants will have some level of impact on the decision made.

Participation of stakeholders is an essential factor in decision making, recognising power, control, and political commitment as central issues. There is an organised process for involving the public as it is not something that

happens accidentally or coincidentally. Stakeholders' participation is not just providing information to the public; it is a technique to be applied according to each unique situation. Public participation is now a legal requirement or prerequisite for governmental decision-making in most of the world, and thus stakeholders' participation in decision-making is increasingly considered as standard practice.

Stakeholders' participation in development interventions of cultural heritage sites should comprise education and training opportunities for local authorities, decision makers, researchers, and community members. Participants should be encouraged to understand and resolve conflicts. It also assists in understanding the meaning of heritage among the various stakeholders in which communities' and experts' values are usually different. In addition, several debates about sustainability in cultural heritage areas have evolved to encourage wider participation in recognising the meaning and symbolic significance of all elements in historic Cairo. Active participation also encourages the efficient re-use of the historic listed buildings. Hence, "sustainability comprehends that cultural diversity is an essential component of cultural identity, sense of community belonging, social inclusion, and participation" (Rodwell, 2007, p.185).

FURTHER RESEARCH

This study sought to identify a comprehensive strategy for sustainable urban development in historic Cairo. The reciprocity between the spatial intervention and socio-economic features of this area was considered the starting point of the study. The design guidelines developed may be replicated for other heritage sites to suit their unique conditions. This section provides recommendations for further research based on the current research findings and limitations encountered.

The long term impact of the Arab Spring revolution on urban development of historic Cairo needs to be investigated. Surveys could be incorporated to examine stakeholders' views and aspirations towards the development of historic Cairo after this major political turmoil. Comparing between attitudes

before and after the revolution would definitely reflect on and possibly change the approaches adopted for future interventions.

Moreover, from the present study, vacant and ruined plots were found to constitute 6% of total plots in historic Cairo (Appendix A, Figure A.2), whereas vacant residential units comprise approximately 14.5% of the total units in Cairo (WB, 2006, p.33), which are significant obstacles to rehabilitation interventions. Absent owners are often unaware of the developments planned for the area and thus fail to be involved and refuse to financially contribute to the initiatives. In-depth surveys of vacant plots should be undertaken to transform them to the advantage of the local residents; into community facilities and services or tourism facilities which, in turn will bring socio-economic benefits to the community. As for vacant residential units, the MOHUUD needs to implement housing policies to strictly limit the unused residential units which augment the deterioration of housing units in the area due to the lack of maintenance. In addition, new integrated urban and management policies need to be addressed for long-term plans whilst considering the rapid urban growth in historic Cairo. Further, developing a realistic housing system and strengthening the National Housing Program would definitely benefit this problematical area.

The impact of climate change on the built environment of historic Cairo is another viable area for further research. Preparing the historic environment for possible impact of the changing climate needs to be considered in future development strategies by forming a database for the different areas of the historic site on GIS where climate data and heritage site locations are overlaid. This would definitely help planners and policy makers to protect, manage, and develop appropriate interventions for historic Cairo in the short and long term to encounter the effects of global climate change.

The researcher suggests the construction of a legal framework to guide conservation, rehabilitation, and new development in the historic city, informed by cross-disciplinary research and collaboration. With increased coordination among ministerial and governmental sectors, agencies, authorities, and the governorates along with experts and researchers, sustainable measures for the

preservation and restoration of tangible and intangible elements of historic Cairo could be achieved. To help achieve sustainable urban development of historic Cairo, it is vital to provide professional training, guidance and supervision for local authority personnel to encourage the adoption of effective environmental management measures. In addition, it would also be essential to disseminate potential project aims and outcomes to the public in order to raise awareness among the local communities for the need to support development projects and initiatives. Ultimately, exploring appropriate methods for involving local participation in regeneration processes would entail a collaborative effort from the Supreme Council of Antiquities with other public sector bodies in Egypt.

References

Abada, G., 2008. Public Initiatives vs. Governmental Efforts in the Development of Urban Heritage in Egypt. In F. Hassan, A. de Trafford & M. Youssef, eds. *Cultural Heritage and Development in the Arab World.* Alexandria: The Bibliotheca Alexandrina. pp.89-111.

Abdel-Fattah, K. & Abdelhalim, A.I., 1985. The Rehabilitation and Up-grading of Historic Cairo. In A. Evin, ed. *The Expanding Metropolis: Coping with the Urban Growth of Cairo.* Singapore: Concept Media & The Aga Khan Award for Architecture. pp.54-60.

Abdul Wahab, R., 2005. *Assessment Study: Social Infrastructure in the Old City Of Aleppo.* Aleppo: German International Cooperation (GIZ) & Directorate of the Old City (DOC).

Abdulaal, W.A., 2012. Large urban developments as the new driver for land development in Jeddah. *Habitat International* , 36(1), pp.36-46.

Abu-Lughod, J., 2007. Cairo, an Islamic Metropolis. In S. Bianca & P. Jodidio, eds. *Cairo: Revitalizing a Historic Metropolis.* 2nd ed. Turin: Umberto Allemandi & Co for The Aga Khan Trust for Culture. pp.19-30.

ADB, 1996. *Mainstreaming Participatory Development Processes.* Guidelines, Handbooks, and Manuals. Manila: Asian Development Bank Office of Environment and Social Development.

AKTC, 2001. *The Azhar Park Project in Cairo and the Conservation and Revitalisation of Darb al-Ahmar.* Cairo: Agha Khan Trust for Culture.

AKTC, 2005a. *Al-Azhar Park, Cairo and The Revitalisation of Darb Al-Ahmar.* Geneva: Aga Khan Trust for Culture.

AKTC, 2005b. *Cairo: Urban Regeneration in The Darb Al-Ahmar District.* Geneva: Aga Khan Trust for Culture.

AKTC, 2007. *An Integrated Approach to Urban Rehabilitation.* Geneva: Aga Khan Trust For Culture.

Al-Hagla, K.S., 2010. Sustainable urban development in historical areas using the tourist trail approach: A case study of the Cultural Heritage and Urban Development (CHUD) project in Saida, Lebanon. *Cities*, 27(4), pp.234-48.

Antoniou, J., 1999. *Historic Cairo: A Walk Through the Islamic City.* Cairo: The American University in Cairo Press.

Antoniou, J., 2007. Cairo's Urban Growth and Its Impact on the Historic City. In S. Bianca & P. Jodidio, eds. *Cairo: Revitalising a Historic Metropolis*. 2nd ed. Turin: Umberto Allemandi & C and Aga Khan Trust for Culture. pp.31-41.

Asdar'Ali, K. & Martina, R., 2010. Remaking Cairo, revisioning al-Darb al-Ahmar. In F. Daftary, E. Fernea & A. Nanji, eds. *Living in Historic Cairo: Past and Present in an Islamic City*. London: Azimuth Editions & Institute of Ismali Studies. pp.180-91.

Aslan, R., 2006. *Rescuing Cairo's Lost Heritage*. [Online] Available at: http://www.worldpress.org/Mideast/2343.cfm [Accessed 05 April 2009].

Bafna, S., 2003. Space Syntax : A Brief Introduction to Its Logic and Analytical Techniques. *Environment and Behavior*, 35(17), pp.17-29.

Baran, P.K., Smith, W.R. & Toker, U., 2007. The Space Syntax and Crime: Evidence from a Suburban Community. In *Proceedings, 6th International Space Syntax Symposium*. İstanbul, 2007. Faculty of Architecture, Istanbul Technical University (ITU).

Barton, H., 1996. Going Green by Design. *Urban Design (Quarterly), Topic: Sustainable Urban Design*, 57, pp.13-18.

Batty, M. & Rana, S., 2004. The automatic definition and generation of axial lines and axial maps. *Environment and Planning B: Planning and Design*, 31(4), pp.615 - 640.

Bell, D., 2009. Naming of the parts. In N. Stanley-Price & J. King, eds. *Conserving the authentic: Essays in Honour of Jukka Jokilehto*. Rome: ICCROM Conservation Studies. pp.55-62.

Bentley, I. et al., 1985. *Responsive Environments: A Manual For Designers*. London: Architectural Press.

Bianca, S., 2000. *Urban Form in the Arab World: Past and Present*. Zurich: vdf Hochschulverlag AG, an der ETH Zurich.

Bianca, S., 2006. *Master Plan for the Surrounding of the Citadel of Aleppo*. Aga Khan Trust for Culture.

Bianca, S., 2007. A New Path to Urban Rehabilitation in Cairo. In S. Bianca & P. Jodidio, eds. *Cairo: Revitalising a Historic Metropolis*. 2nd ed. Turin: Umberto Allemandi & Co & Aga Khan Trust for Culture. pp.69-148.

Bianca, S., 2010. Historic cities in the 21st century: core values for a globalizing world. In R.v. Oers & S. Haraguchi, eds. *Managing Historic Cities*. Paris: UNESCO World Heritage Centre. pp.27-33.

Bianca, S. & Jodidio, P., 2007. *Cairo: Revitalising a Historic Metropolis*. 2nd ed. Turin: Umberto Allemandi & Co & Aga Khan Trust for Culture.

Bianca, S., Siravo, F., Rashti, C. & Matero, F., 2010. The Project of the Aga Khan Trust for Culture in al-Darb al-Ahmar area of Historic Cairo. In F. Daftary, E. Fernea & A. Nanji, eds. *Living in Historic Cairo: Past and Present in an Islamic City*. London: Azimuth Editions & Institute of Ismali Studies. pp.242-63.

BIO Intelligence Service, 2012. *Policies to encourage sustainable consumption*. Final report prepared for. European Commission (DG ENV).

Bitar, K., 2006. *The Rehabilitation of Shibani Building*. Aleppo: German International Cooperation (GIZ) & Directorate of the Old City (DOC).

Breheny, M.J., 1992. Sustainable Development and Urban Form: An Introduction. In M.J. Breheny, ed. *Sustainable Development and Urban Form*. London: Pion Ltd. pp.1-23.

Brewerton, P. & Millward, L., 2001. *Organizational Research Methods- A guide for students and researchers*. London: Sage Publications.

Brody, S.D., Godschalk, D.R. & Burby, R.J., 2003. Mandating Citizen Participation in Plan Making: Six Strategic Planning Choices. *Journal of the American Planning Association*, 69(3), pp.245-64.

Broome, J., 2005. Mass housing cannot be sustained. In P. Jones, D. Petrescu & J. Till, eds. *Architecture and Participation*. Oxon: Spon Press. pp.65-75.

Busquets, J., 2005. Why Aleppo? In J. Busquets, ed. *Aleppo: Rehabilitation of the Old City*. Cambridge, Massachusetts: Harvard University Graduate School of Design. pp.11-24.

Camagni, R., 1998. Sustainable urban development: definition and reasons for a research programme. *International Journal of Environment and Pollution (IJEP)*, 10(1), pp.6-27.

Can, I., 2012. *In-Between Space and Social Interaction: A Case Study of Three Neighbourhoods in Izmir*. Unpublished PhD Thesis. Nottingham: University of Nottingham.

CAPMAS, 2009. *The final results of Population and Housing Census 2006*. [Online] Available at: http://www.msrintranet.capmas.gov.eg/pls/fdl/ab2?lang=0&lname= [Accessed 07 July 2010].

Carmona, M., 2009. Sustainable Urban Design: Principles to Practice. *International Journal of Sustainable Development*, 12(1), pp.48-77.

Carmona, M., De Magalhãães, C. & Edwards, M., 2002. Stakeholder Views on Value and Urban Design. *Journal of Urban Design*, 7(2), p.145–169.

Carmona, M., Tiesdell, S., Heath, T. & Oc, T., 2010. *Public Places Urban Spaces: The Dimensions of Urban Design*. 2nd ed. Oxford: Architectural Press.

Cassar, M., 2006. *Sustainability and the Historic Environment*. London: Centre for Sustainable Heritage, The Bartlett, UCL.

CDC, 2008. *Al-Darb al-Ahmar Revitalization Project: 2008 Progress Report*. Cairo: Aga Khan Development Network Al-Darb Al-Ahmar Community Development Company (ADAA CDC).

Cernea, M.M., 2008. Economic development and cultural heritage: Policy issues and unrealized potentials. In F. Hassan, A. de Trafford & M. Youssef, eds. *Cultural Heritage and Development in the Arab World*. Alexandria: The Bibliotica Alexandrina. pp.111-45.

Chibli, M., 1998. *Subject Plan Environment & Air Pollution Management:Impact of Energy consumption of the Urban Transport sector on the Environment of Aleppo city*. Aleppo: German International Cooperation (GIZ) & Directorate of the Old City (DOC).

Chibli, M., 2002. The Urban Environmment in the Historic Context: The Case of the old city of Aleppo-Syria. In Boonstra, C., Rovers, R. & Pauwels, S., eds. *International Conference Sustainable Building 2000, 22-25 October*. Sittard, 2002. Novem & Eneas Technical Publishers.

Chibli, M., 2004. *Green Building Guidelines*. Aleppo: German International Cooperation (GIZ) & Directorate of the Old City (DOC).

Chibli, M., Windelberg, J. & Kelzieh, T., 2000. *Local Agenda 21 for the Old City of Aleppo*. Sustainable Urban Rehabilitation Architectural Design and Engineering Consortium (SURADEC).

Choi, A.-S., Kim, Y.-O., Oh, E.-S. & Kim, Y.-S., 2006. Application of the space syntax theory to quantitative street lighting design. *Building and Environment*, 41(3), pp.355-66.

Church, D., 2009. *Photos taken in Egypt 1952-1956*. [Online] Available at: http://www.coug.net/egypt/index.htm [Accessed 21 October 2011].

Clarke, P., 2009. Urban planning and design. In A. Ritchie & R. Thomas, eds. *Sustainable Urban Design: An Environmental Approach.* 2nd ed. London: Taylor & Francis Group. pp.12-20.

Coaffee, J., 2008. Risk, resilience, and environmentally sustainable cities. *Energy Policy*, 36(12), p.4633–4638.

Creighton, J., 2005. *The Public Participation Handbook: Making Better Decisions Through Citizen Involvement.* San Francisco: Jossey-Bass.

Creswell, J.W., 2007. *Qualitative Inquiry and Research Design - Choosing among Five Traditions.* 2nd ed. London: SAGE Publications.

Creswell, J.W., 2008. *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches.* 3rd ed. London: SAGE Publications Inc.

Creswell, J.W. & Clark, V.L.P., 2011. *Designing and Conducting Mixed Methods Research.* 2nd ed. California: Sage Publications, Inc.

Dalton, N.S., 2007. Is Neighbourhood Measurable? In *Proceedings, 6th International Space Syntax Symposium.* İstanbul, 2007. Faculty of Architecture, Istanbul Technical University (ITU).

Denscombe, M., 2007. *The Good Research Guide: For Small-scale Social Research Projects.* 3rd ed. New York: Open University Press.

El Rashidi, S., 2007. The History and Fate of al-Darb al-Ahmar. In S. Bianca & P. Jodidio, eds. *Cairo: Revitalising a Historic Metropolis.* 2nd ed. Turin: Umberto Allemandi & Co for The Aga Khan Trust for Culture. pp.55-65.

El-Aref, N., 2008. Unholy thefts. *Al-Ahram Weekly, Issue No. 903.*

EU Working Group on Urban Design for Sustainability, 2004. *Urban Design for Sustainability.* [Online] Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management, Austria Available at: http://ec.europa.eu/environment/urban/pdf/0404final_report.pdf [Accessed 15 September 2010].

Fahmi, W. & Sutton, K., 2003. Reviving historical Cairo through pedestrianisation. *International Development Planning Review, Liverpool University Press*, 25 (4), pp.407-31.

Ferguson, P., 2009. Scale Unbound Analyses. In *Proceedings of the 7th International Space Syntax Symposium.* Stockholm, 2009. Space Syntax & KTH Royal Institute of Technology.

Gerring, J., 2007. *Case Study Research Principles and Practices.* New York: Cambridge University Press.

Gharib, R.Y., 2010. *Revitalising Historic Cairo: Examining The Public Policy Formulation and Implementation.* Unpublished PhD Thesis. Nottingham: University of Nottingham.

Gil, J., Stutz, C. & Chiaradia, A., 2007. Confeego: tool set for spatial configuration studies. In *Proceedings 6th International Space Syntax Symposium.* Istanbul, 2007. Istanbul Technical University.

GIZ, 2005. *Designing Tomorrow's Cities.* Eschborn: German International Cooperation (GIZ).

GIZ, 2008. *Living Historic Cities and Urban Cultures: Integrated revitalization of historic centers.* Eschborn: German International Cooperation (GIZ) the German Federal Ministry for Economic Cooperation and Development (BMZ).

Grabar, O., 1984. The Meaning of Historic Cairo. In *The Expanding Metropolis Coping with the Urban Growth of Cairo.* Cairo, 1984. Concept Media Pte Ltd Singapore.

Groat, L. & Wang, D., 2002. *Architectural Research Methods.* New York: John Wiley & Sons, Inc.

Hampikian, N., 2007. A decisive moment for the suvival of historic Cairo. In Bianca, S. & Jodido, P. *Cairo: Revitalising a Historic Metropolis.* 2nd ed. Rome: Umberto Allemandi & Co & Aga Khan Trust for Culture. pp.209-19.

Haughton, G. & Hunter, C., 1994. *Sustainable cities.* London: Jessica Kingsley Publishers Ltd.

HCP, 2007. *An Integrated Approach to Urban Rehabilitation.* Report. Geneva: Aga Khan Trust For Culture & Aga Khan Historic Cities Programme.

Herrle, P., Nebel, S. & Bitar, K., 2005. *Old City of Aleppo:Conservation and Development Strategy.* Aleppo & Berlin: German International Cooperation (GIZ) & Directorate of the Old City (DOC).

Hillier, B., 1988. Against Enclosure. In N. Teymur, T.A. Markus & T. Woolley, eds. *Rehumanizing Housing.* London : Butterworth & Co. Ltd. pp.63-88.

Hillier, B., 1996. *Space is the Machine: A configurational Theory of Architecture.* Cambridge : Cambridge University Press.

Hillier, B., 2008. Using space syntax to regenerate the historic centre of Jeddah. In *Tools for governance, presentation was delivered on 2nd July.* Turin, 2008. UIA World Congress.

Hillier, B., 2009. Spatial Sustainability in Cities:Organic Patterns and Sustainable Forms. In Koch, D., Marcus, L. & Steen, J., eds. *Proceedings of the 7th International Space Syntax Symposium, KTH.* Stockholm, 2009.

Hillier, B. & Hanson, J., 1984. *The Social Logic of Space.* Cambridge: Cambridge University Press.

Hillier, B., Hanson, J. & Peponis, J., 1987. Syntactic Analysis of Settlements. *Architecture et Comportement / Architecture and Behaviour*, 3 (3), pp.217-31.

Hillier, B. & Penn, A., 2004. Rejoinder to Carlo Ratti. *Environment and Planning B: Planning and Design*, 31(4), pp.501-11.

Hillier, B. & Sahbaz, O., 2009. Crime and Urban Design: An Evidence- Based Approach. In Cooper, R., Evans, G. & Boyko, C. *Designing Sustainable Cities:Decision-making Tools and Resources for Design.* 1st ed. London: Willey-Blackwell Publishing Ltd. pp.163-85.

Hillier, B., Stoner, T. & Karimi, K., 2008. *Using space syntax to regenerate the historic centre of Jeddah.* Torino: Programme XXIII UIA WORLD ARCHITECTURE CONGRESS Space Syntax Limited.

Ibrahim, S.E., 2001. Addressing the social context in cultural heritage management in historic Cairo. In I. Serageldin, E. Shluger & J. Martin-Brown, eds. *Historic Cities and Sacred Sites: Cultural Roots for Urban Futures.* Washington, D.C.: The World Bank. pp.186- 191.

Ibrahim, K. & El Rashidi, S., 2010. Contemporary Observations of Al-Darb Al-Ahmar. In F. Daftary, E. Fernea & A. Nanji, eds. *Living in Historic Cairo: Past and Present in an Islamic City.* London: Azimuth Editions & Institute of Ismali Studies. pp.172-79.

ICOMOS, 1987. *Charter For The Conservation of Historic Towns And Urban Areas (Washington Charter).* [Online] ICOMOS General Assembly in Washington, DC Available at: http://www.international.icomos.org/charters/towns_e.htm [Accessed 29 September 2011].

ICOMOS, 1999a. *The Burra Charter: the Australia ICOMOS Charter for Places of Cultural Significance.* Australia: Australia ICOMOS Incorporated, International Council of Monuments and Sites.

ICOMOS, 1999b. *International Cultural Tourism Charter: Managing Tourism at Places of Heritage Significance.* [Online] General Assembly of ICOMOS, Mexico Available at: http://www.international.icomos.org/charters/tourism_e.htm [Accessed 03 October 2011].

Jackson, T. & Marks, N., 1999. Consumption, sustainable welfare and human needs-with reference to UK expenditure patterns between 1954 and 1994. *Ecological Economics*, 28(3), pp.421-41.

Jansen, G.D. & Tabor, P., 2002. *Subject Plan Traffic and Transportation: Overall Traffic Concept Old City of Aleppo.* Essen : Planco Consulting GmbH & German International Cooperation (GIZ).

Jeddah Muncipality , 2009. *Jeddah Strategic Plan: Building our future, preserving our heritage and values.* Jeddah : Jeddah Muncipality.

Jiang, B. & Claramunt, C., 2002. Integration of Space Syntax into GIS: New Perspectives for Urban Morphology. *Transactions in GIS, 6(3)*, pp.295-309.

Jiang, B., Claramunt, C. & Klarqvist, B., 2000. Integration of Space Syntax into GIS for Modelling Urban Spaces.

Jokilehto, J., 2011. *ICCROM and the Conservation of Cultural Heritage: a History of the Organization's first 50 years.* Rome: International Centre for the Study of the Preservation and Restoration of Cultural Property (ICCROM).

Jones, C., Griffiths, S., Mordechai, H. & Vaughan, L., 2009. A multi-disciplinary perspective on the built environment :Space Syntax and Cartography– the communication challenge. In Koch, D., Marcus, L. & Steen, J., eds. *Proceedings of the 7th International Space Syntax Symposium.* Stockholm, 2009. The Royal Institute of Technology /Kungliga Tekniska högskolan (KTH).

Karimi, K. et al., 2007. Evidence-Based Spatial Intervention For Regeneration Of Informal Settlements: The Case Of Jeddah Central Unplanned Areas. In *Proceedings 6th International Space Syntax Symposium.* İstanbul, 2007. Faculty of Architecture, Istanbul Technical University (ITU).

Karimi, K. & Parham, E., 2008. *Saptial Improvement Plan: Jeddah, Saudi Arabia.* Final Report,Presentation & Reports. London: Space Syntax Team, Phase Two Jeddah Municipality.

Karimi, K. & Parham, E., 2010. *Urban Development Framework.* London: Space Syntax Team & Jeddah Development and Urban Regeneration Company (JDURC).

Khechen, M., 2005. Saptial Restructuring and Participatory Public Action. In J. Busquets, ed. *Aleppo: Rehabilitation of the Old City.* Cambridge, Massachusetts: Harvard University Graduate School of Design. pp.55-69.

Khoder, M.I., 2007. Ambient levels of volatile organic compounds in the atmosphere of Greater Cairo. *Atmospheric Environment*, 41(3), pp.554-566.

Kim, H.-K. & Sohn, D.W., 2002. An analysis of the relationship between land use density of office buildings and urban street configuration. *Cities*, 19(6), p.409–418.

Kondolf, G.M., Marzion, R. & Mozingo, L., 2011. *Connecting Cairo to the Nile: Renewing life and heritage on the river.* Working Paper. California: Department of Landscape Architecture & Environmental Planning, University of California, Berkeley IURD Working Paper No. WP-2011-06.

Kubat, A.S. et al., 2012. Application of Space Syntax in Developing: A regeneration framework for Sharjah's heritage area. In Greene, M., Reyes, J. & Castro, A., eds. *Proceedings: Eighth International Space Syntax Symposium.* Santiago de Chile: PUC, 2012.

Lane, J., 1995. Non-governmental organisations and participatory development: the concept in theory versus the concept in practice. In S. Wright & N. Nelson, eds. *Power and Participatory Development: Theory and Practice.* London: Intermediate Technology Publications. pp.181-91.

Larkham, P., 1996. *Conservation and the city.* London: Routledge.

Le, T.T.K., 2007. *Identifying Town Centres: Public Participation And Town Centre Indicator Combinations.* Unpublished PhD Thesis. Nottingham: University of Nottingham.

Lund, H., 2002. Pedestrian Environments and sense of community. *Journal of Planning Education and Research*, 21(3), pp.301-12.

Lynch, K., 1960. *The Image of the City.* Cambridge: MIT press.

Machat, C. & Petzet, M., 2010. Introduction. In C. Machat, M. Petzet & J. Ziesemer, eds. *Heritage at risk: ICOMOS World Report 2008-2010.* Berlin: hendrik Bäßler verlag. pp.11-14.

Massa, H., 2011. *Community approach to rehabilitation of historic district.* [Online] Available at: http://www.egyptindependent.com/news/community-approach-rehabilitation-historic-district [Accessed 18 June 2012].

McCall, B., 1988. The Effects of Rent Control in Egypt: Part III. *Arab Law Quarterly*, 3(4), pp.345-65.

MCSLC, 2010. *El-Moez Street.* [Online] Available at: http://www.soundandlight.com.eg/Projects/projects/AlMoezStreet.aspx [Accessed 30 October 2011].

Mohareb, N.I., 2009a. Re-reading Historical Cairo: Spatial Configuration Transformation. In Koch, D., Marcus, L. & Steen, J., eds. *Proceedings of the*

7th International Space Syntax Symposium. Stockholm, 2009a. The Royal Institute of Technology / Kungliga Tekniska högskolan (KTH).

Mohareb, N.I., 2009b. Street morphology and its effect on pedestrian movement in historical Cairo. *Cognitive Processing (2009), Springer-Verlag Berlin*, 10(2), p.S253–S256.

Moon, C.J., 2001. *Stakeholder Approaches to Community Participation in Urban Development: Conceptual and Methodological Links*. Unpublished PhD Thesis. London: University of London.

Morbidoni, M. & Allegretti, G., 2010. *Cairo, Egypt: The Al-Darb Al-Ahmar Housing Rehabilitation Programme*. Report. Portugal: Committee on Social Inclusion and Participative Democracy United Cities and Local Governments.

Nasser, N., 2003. Planning for Urban Heritage Places: Reconciling Conservation, Tourism, and Sustainable Development. *Journal of Planning Literature*, 17(4), pp.467-79.

Nebel, S. & Spiekermann, M., 2008. *Tool Kit for Urban Conservation and Development*. [Online] Available at: http://www.udp-aleppo.org/toolkit/mod/ar/mod0/00.html [Accessed 18 February 2013].

Nour, H., 2010. Sustainability in Al Darb Al Ahmar District: An Egyptian Experience. In *SB10mad Sustainable Building Conference, April 28- 30*. Madrid, 2010. Green Building Council Spain.

OECD, 2001. *Policies to Enhance Sustainable Development*. Paris,: Organisation For Economic Cooperation and Development.

Önder, D.E. & Gigi, Y., 2010. Reading urban spaces by the space-syntax method: A proposal for the South Haliç Region. *Cities*, 27(4), pp.260-71.

Osman, K.M. & Suliman, M., 1995. The Space Syntax Methodology: Fits and Misfits. *Architecture et Comportement / Architecture and Behaviour*, 10(2), pp.189 -204.

Ouf, A.M., 2002. Community development projects in older city districts. *International Development Planning Review (IDPR), Liverpool University Press*, 24 (3), pp.299-314.

OWHC, 2007. *The project for rehabilitation*. [Online] Available at: http://urbo.ovpm.org/index.php?module=pagesetter&func=viewpub&tid=4&pid=2 [Accessed 20 December 2012].

OWHC, 2011. *Cairo*. [Online] Available at: http://www.ovpm.org/en/cities [Accessed 20 December 2011].

Pateman, C., 1970. *Participation and democratic theory.* Cambridge: Cambridge University Press.

Planco Consulting GmbH, 2003. *Old City of Aleppo: Traffic and Transportation concept.* Essen & Aleppo: Traffic Group - Directorate of the Old City of Aleppo.

Raford, N. & Hillier, B., 2005. Correlation Landscapes: A New Approach to Sub-Area Definition in Low Intelligibility. In *Fifth International Space Syntax Symposium,*. Delft, 2005.

Rapoport, A., 1983. Development, Culture Change and Supportive Design. *Habitat International,* 7(5), pp.249-68.

Rashed, H., 2012a. Community participation as a tool for rehabilitating heritage sites. In Borsi, K. & Dumaz, B., eds. *Design Place: International Design Conference, 2-3 April.* Nottingham, 2012a. The University of Nottingham, Urban Design Research Group.

Rashed, H., 2012b. The problematical involvement of local communities in built-heritage conservation interventions: the case of historic Cairo. In Romice, O., Edgerton, E. & Thwaites, K., eds. *Human Experience in the Natural and Built Environment: Implications for Reserach Policy and Practice,24-29 June.* Glasgow, 2012b. International Association for People-Environment Studies (IAPS).

Rashed, H. & Elsharkawy, H., 2009. Heritage Museums between Real and Virtual: Enhancing Visitors' Experience. In *ISAAC International Conference: Promoting Cultural Heritage Tourism through Integrated e-Services.* Amsterdam, 2009.

Ratti, C., 2004. Rejoinder to Hillier and Penn. *Environment and Planning B: Planning and Design,* 31(4), p.513 – 516.

Raymond, A., 2002. *Cairo.* Cambridge, Massachusetts: Harvard University Press.

Ridenour, C.S. & Newman, I., 2008. *Mixed Methods Research - Exploring the Interactive Continuum.* Carbondale: Southern Illinois University Press.

Rodwell, D., 2007. *Conservation and Sustainability in Historic Cities.* Oxford: Blackwell Publishing Ltd.

Rogers, R., 1997. *Cities for a Small Planet.* London: Faber and Faber Limited.

Salama, A., 2000. Cultural Sustainability of Historic Cities: Notes on Conservation Projects in Old Cairo. In *Metropolis 21st Century, Cities, Social*

Life and Sustainability, Which Prespectives? Paris, 2000. International Association for People-Environment Studies (IAPS).

Salama, A.M., 2008. Media Coverage and Users' Reactions: Al Azhar Park in the midst of Criticism and Post Occupancy Evaluation. *Middle East Technical University, Journal of the Faculty of Architecture*, 25(1), pp.105-25.

Sanoff, H., 2000. *Community Participation Methods in Design and Planning.* New York: John Wiley& Sons, Inc.

Sarkis, H., 2005. Civic Pride. In J. Busquets, ed. *Aleppo: Rehabilitation of the Old City.* Cambridge, Massachusetts: Harvard University Graduate School of Design. pp.32-39.

SCA, 2002. *Historic Cairo.* Cairo: Ministry of Culture & Supreme Council for Antiquities.

Schade-Poulsen, M., Rothpfeffer, T. & Manceron, G., 1999. *Freedom of Association and Human Rights Organisations in Egypt.* Copenhagen: Euro-Mediterranean Human Rights Network in cooperation with the International Federation of Human Rights.

SCTA, 2006. *Historical Area of Jeddah.* Jeddah : Makkah Province, Jeddah Governorate Saudi Commission for Tourism & Antiquities.

SDC, 2006. *Stock Take: Delivering improvements in existing houses.* London: Sustainable Development Commission.

Sedky, A., 2009. *Living with Heritage in Cairo: Area Conservation in the Arab Islamic City.* Cairo: The American University in Cairo Press.

Serageldin, M., 2004. Monitoring Processes of Change in Historic Centres. *World Heritage Series n°10 - Monitoring World Heritage* , May. pp.53-58.

Shamsuddin, S. & Ujang, N., 2008. Making places: The role of attachment in creating the sense of place for traditional streets in Malaysia. *Habitat International*, 32(3), pp.399-409.

Shchayeb, D.K., 2009. Advantages of Living in Informal Areas. In R. Kipper & M. Fischer, eds. *Cairo's Informal Areas Between Urban Challenges and Hidden Potentials.* Cairo: German International Cooperation (GIZ). pp.35-44.

Shchayeb, D.K. & Sedky, A., 2002. Heritage Conservation Against What? A Model to Explain Adverse Change in Historic Districts. In *First International Conference of the UIA-WPAHR-V on Architecture & Heritage as a Paradigm for Knowledge and Development: Lessons of the Past, New Inventions and Future Challenges.* Alexandria, 2002.

Shen, S., Schüüttemeyer, A. & Braun, B., 2009. Visitors' Intention to Visit World Cultural Heritage Sites: An Empirical Study of Suzhou, China. *Journal of Travel and Tourism Marketing*, 26(7), pp.722-34.

Shu, C.-F., 2009. Spatial Configuration of Residential Area and Vulnerability of Burglary: Case Studies from UK and Taiwan. In Koch, D., Marcus, L. & Steen, J., eds. *Proceedings of the 7th International Space Syntax Symposium*. Stockholm, 2009. KTH : The Royal Institute of Technology.

Sims, D., Sejoume, M. & El Shorbagi, M., 2003. *Urban Slums Reports: The case of Cairo, Egypt*. London: UN-Habitat, Understanding Slums: Case Studies for the Global Report on Human Settlements, Earthscan.

Siravo, F., 2001. Reversing the Decline of A Historic District. In S. Bianca, ed. *The Azhar Park Project in Cairo and the Conservation and Revitalisation of Darb al-Ahmar*. Geneva: Imprimeries Réunies Lausanne s.a. (IRL) & Aga Khan Trust for Culture (Historic Cities Support Programme). pp.35-54.

Smart Growth Network, 2011. *Smart Growth Principles*. [Online] Available at: http://www.smartgrowth.org/engine/index.php/principles/ [Accessed 30 October 2011].

Spiekermann, M., 2010. *The Sustainability of Urban Heritage Preservation: The Case of Aleppo*. Washington: Inter-American Development Bank (IDB).

Stake, R.E., 1995. *The Art of Case Study Research*. California: Sage Publications, Inc.

Stake, R.E., 2006. *Multiple Case Study Analysis*. New York: Guilford Publications, Inc.

Steinberg, F., 1996. Conservation and rehabilitation of urban heritage in developing countries. *Habitat International*, 20(3), pp.463-75.

Stellmach, T. & Saad, A., 2010. *Aleppo Diverse Open City: An Urban Vision for the Year 2025*. Final Report. Aleppo & Germany: German International Cooperation (GIZ) Syrian- German International Cooperation, Sustainable Urban Development Programme & Aleppo Urban Development Project.

Sutton, K. & Fahim, W., 2002. The rehabilitation of Old Cairo. *Habitat International*, 26, pp.73-93.

Tiesdell, S., Oc, T. & Heath, T., 1996. *Revitalizing Historic Urban Quarters*. Oxford: Architectural press.

Turner, A., Penn, A. & Hillier, B., 2005. An algorithmic definition of the axial map. *Environment and Planning B: Planning and Design*, 32, pp.425 - 444.

Tweed, C. & Sutherland, M., 2007. Built cultural heritage and sustainable urban development. *Landscape and Urban Planning*, 83(1), pp.62-69.

UNCHS-Habitat, 2001. *Tools to Support Participatory Urban Design Making.* Nairobi: Dutch Government and the Local Leadership and Management Programme of the United Nations Centre for Human Settlements - UNCHS (Habitat).

UNDP & SCA, 1997. *Rehabilitation of historic Cairo.* Final report. Cairo: Technical Cooperation Office- United Nations Development Program & Supreme Council for Antiquities.

UNESCO/CLT/WHC, 2011. *Historic Cairo.* [Online] UNESCO World Heritage Centre Available at: http://whc.unesco.org/pg.cfm?cid=31&id_site=89 [Accessed 21 October 2011].

UNESCO, 1980. *The conservation of the old city of Cairo.* Paris: United Nations Educational, Scientific and Cultural Organization.

UNESCO, 2008. *The Inventory of the historic city of Sana'a: a tool for urban conservation.* Paris: United Nations Educational, Scientific and Cultural Organization UNESCO/Italian Funds-in-Trust.

UNESCO, 2009. *Historic Districts for All: A Social and Human Approach for Sustainable revitalization.* Paris: United Nations Educational, Scientific and Cultural Organisation.

UNESCO, 2012. *Management of World Heritage sites:Urban Regeneration Project for Historic Cairo.* Special Projects Unit. Cairo: United Nations Educational, Scientific and Cultural Organization Urban Regeneration ProjectforHistoric Cairo (URHC).

UN-HABITAT , 2008. *Best Practices on Social Sustainability in Historic Districts.* Nairobi: United Nations Human Settlements Programme & United Nations Educational, Scientific and Cultural Organisation.

URBED , 1997. *The Model Sustainable Urban Neighbourhood.* [Online] Sun Dial, the Journal of the Sustainable Urban Neighbourhood Initiative, Urbanism, Environment and Design (URBED),Issue 4, Spring/Summer 1997 Available at: http://www.urbed.coop/journal_docs/SUN%20Dial%204%20Spring-Summer%201997.pdf [Accessed 05 December 2011].

USAID, 2008. *Egypt Housing Survey Methodology.* Cairo: Bearingpoint, INC., USAID & Egypt Policy and Private Sector Office.

Vecco, M., 2010. A definition of cultural heritage: From the tangible to the intangible. *Journal of Cultural Heritage*, 11(3), p.321–324.

Vincent, L. & Sergie, L., 2005. An Urban History of Aleppo. In J. Busquets, ed. *Aleppo: Rehabilitation of the Old City*. Cambridge, Massachusetts: Harvard University Graduate School of Design. pp.41-53.

von Rabenau, B., 2003. *Old City of Aleppo Economic Development*. Aleppo and Columbus: German International Cooperation (GIZ) & Directorate of the Old City (DOC).

Wadley, D., 2010. Exploring a quality of life, self-determined. *Architectural Science Review*, 53(1), pp.12-20.

Wadley, D. & Ballock, M., 1980. Satisfaction and Positive Resettlement: Evidence From Yallourn,Latrobe Valley, Australia. *Journal of the American Planning Association, 46:1*, pp.64-75.

Waller-Hunter, J. & Jones, T., 2002. Globalisation and sustainable Development. *International Review For Environmental Strategies*, 3(1), pp.53-62.

WB, 1996. *The World Bank Participation Source Book*. Washington: The International Bank for Reconstruction and Developmenlt & The World Bank.

WB, 2006. *Analysis of Housing Supply Mechanisms*. Cairo: The World Bank Finance, Private Sector and Infrastructure Group Middle East and North Africa.

WCED, 2008. Towards Sustainable Development. In S.M. Wheeler & T. Beatley, eds. *The Sustainable Urban Developement Reader*. 2nd ed. London and New York: Routledge:Taylor and Francis Group. pp.53-57.

Welbeck, S., 2010. *A Break From The Pyramids " The Alternative Tourist Guide"*. [Online] Available at: http://www.londontocairo.com/wp-content/uploads/2010/06/Khan-El-Khalili.jpg [Accessed 21 October 2011].

WHS, 2011. *World Heritage Site*. [Online] Available at: http://www.worldheritagesite.org/sites/cairo.html [Accessed 21 October 2011].

Williams, R.A., 2000. Environmental Planning for Sustainable Urban Development. In *Caribbean Water and WasteWater Association, 9th Annual Conference & Exihibition, 2-6 October*. Chaguaramas, Trinidad, 2000.

Yin, R., 2003. *Case Study Research: Design and Methods*. 3rd ed. London: Sage Publications Inc.

Yung, E. & Chan, E., 2011. Problem issues of public participation in built-heritage conservation:Two controversial cases in Hong Kong. *Habitat International*, 35(3), pp.457-66.

Zehner, R.B. & Marans, R.W., 1973. Residential Density, Planning Objectives and Life in Planned Communities. *Journal of the American Institute of Planners*, 39(5), pp.337-45.

Appendix A: Historic Cairo Maps

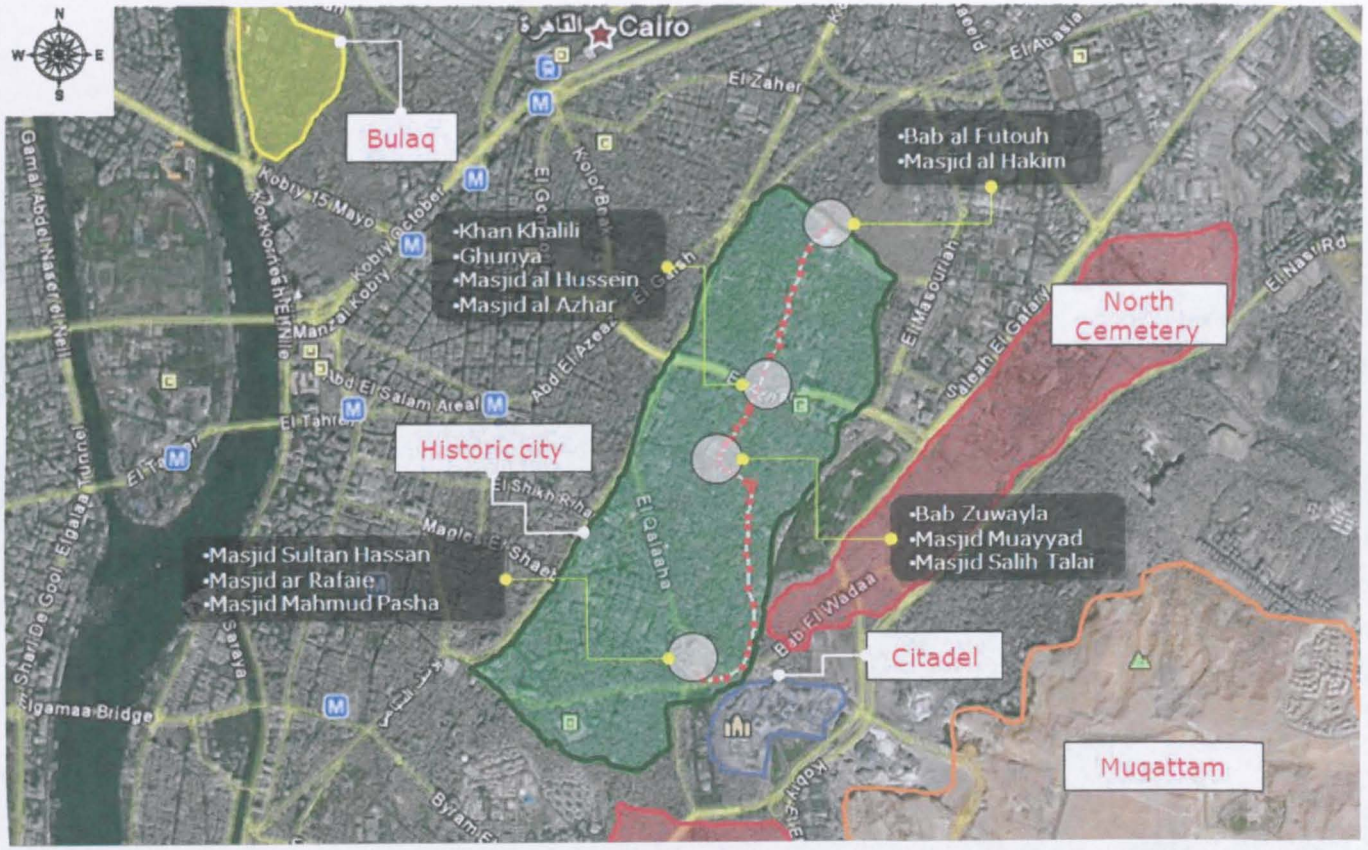


Figure A.1 Location of historic Cairo in Greater Cairo

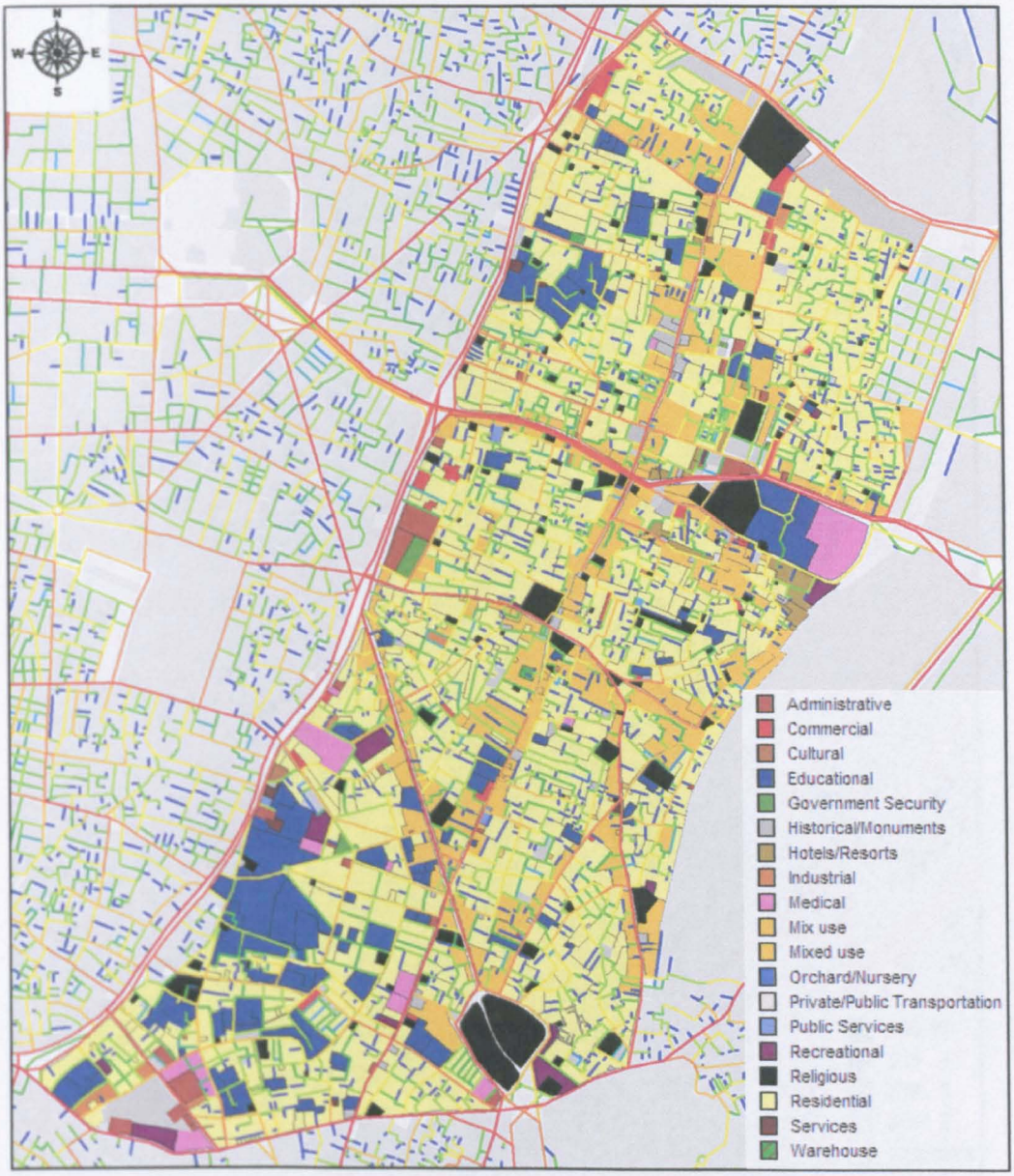
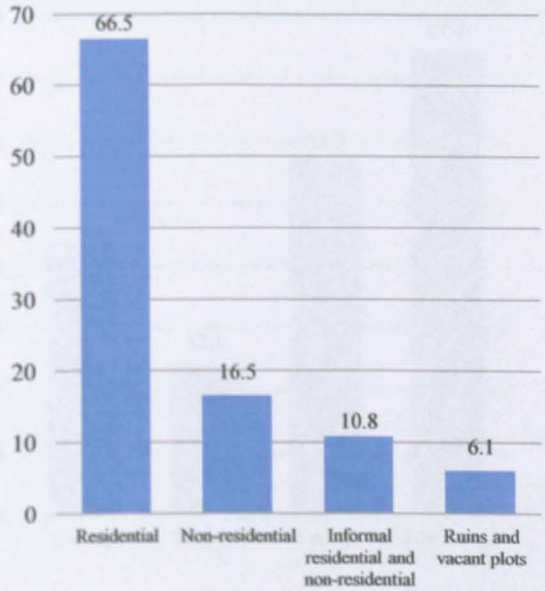


Figure A. 2 Land Use in HC



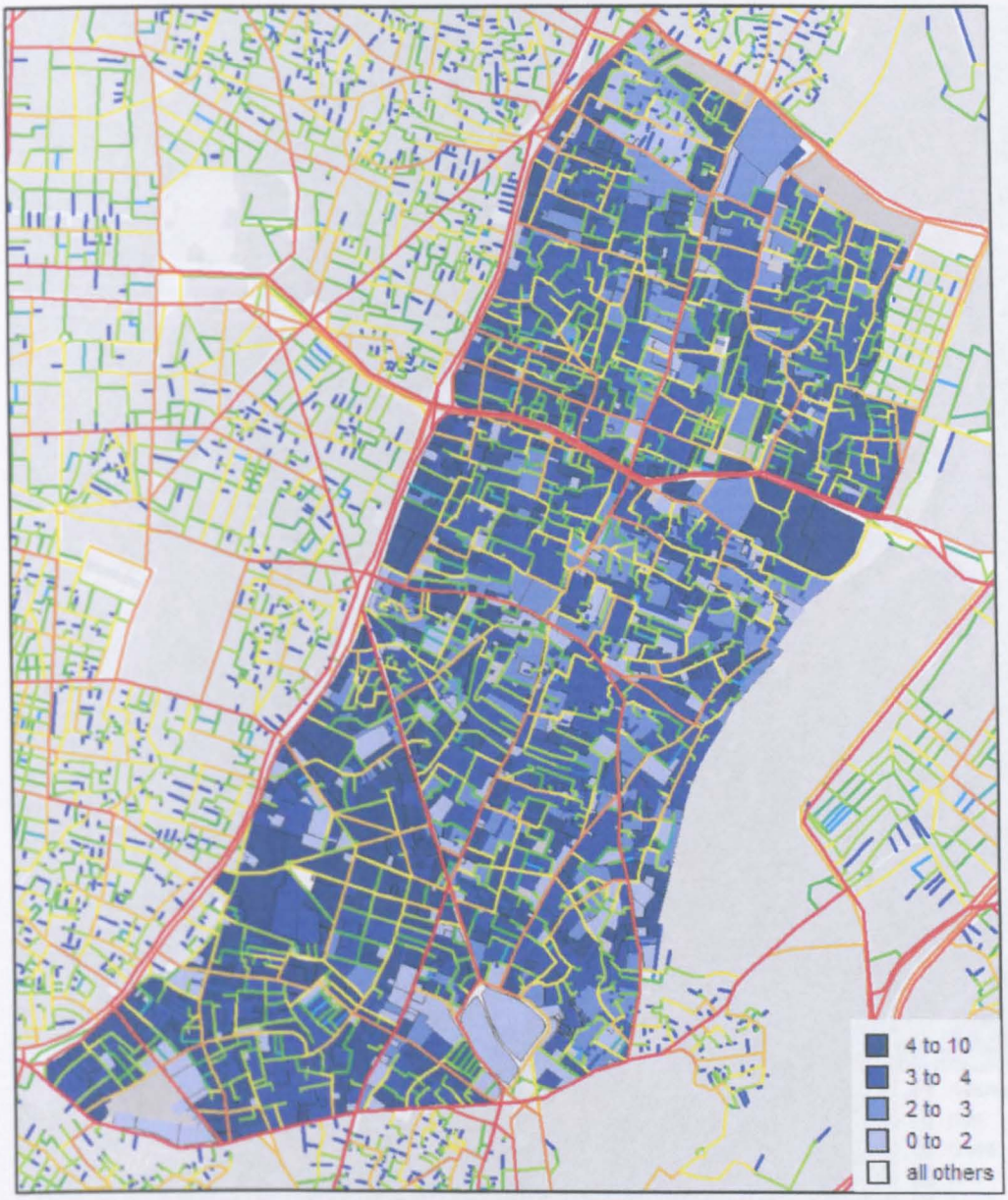
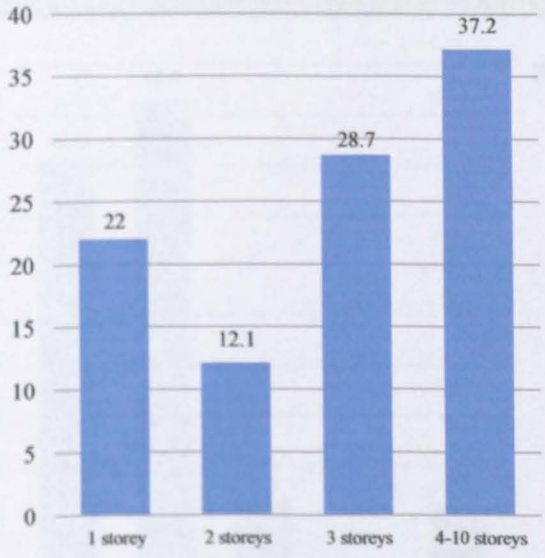
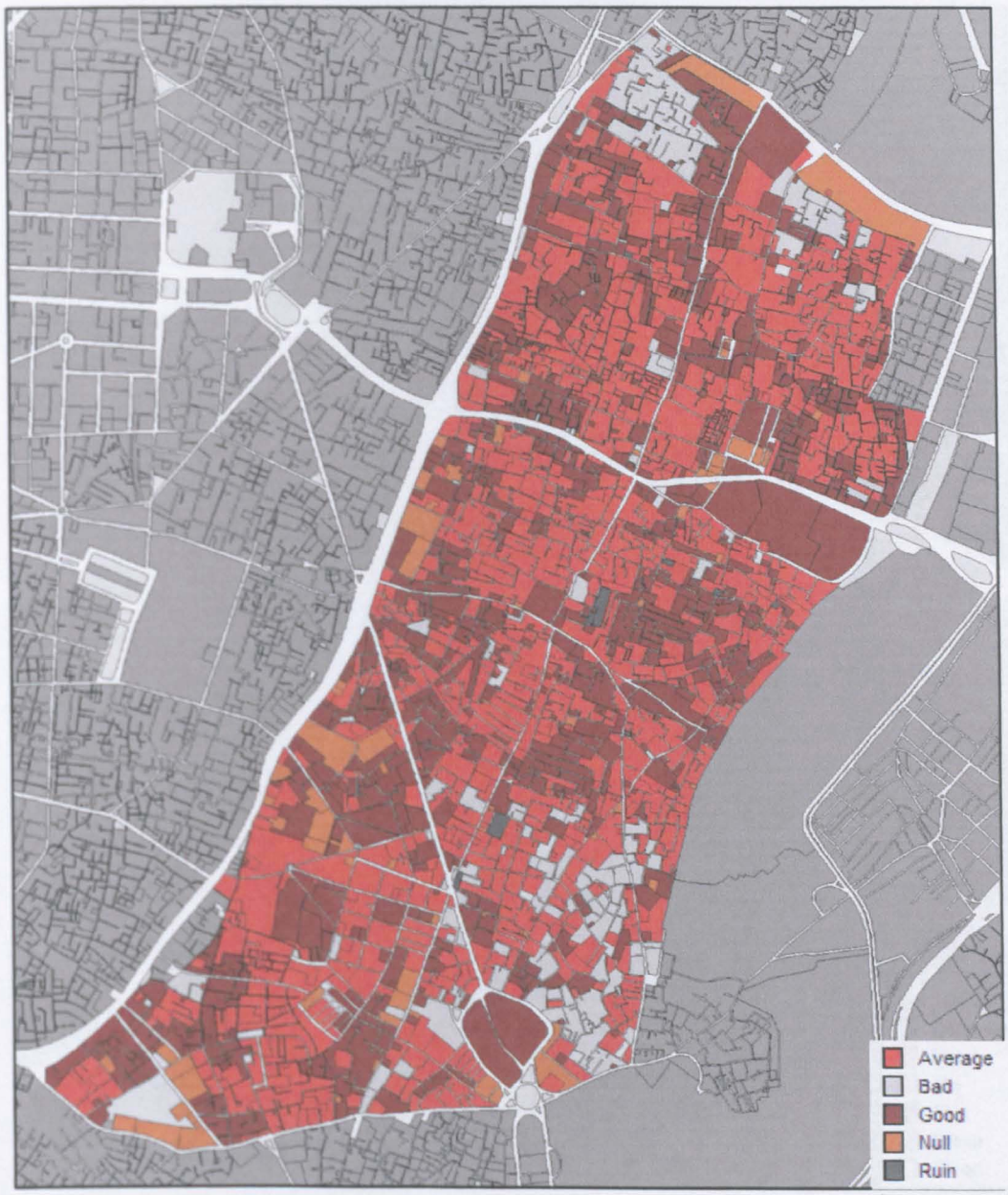


Figure A.3 Building heights in HC





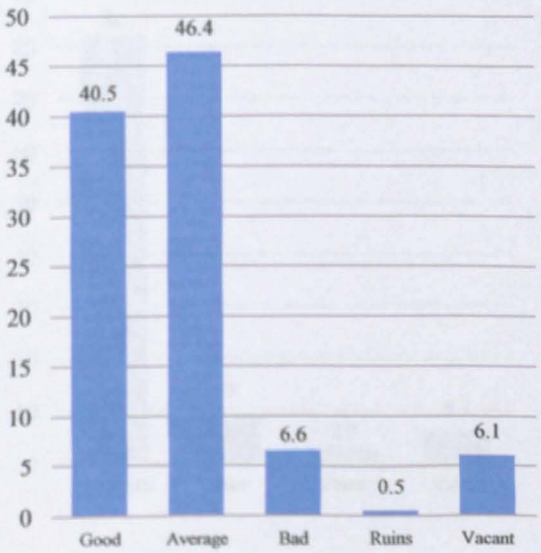
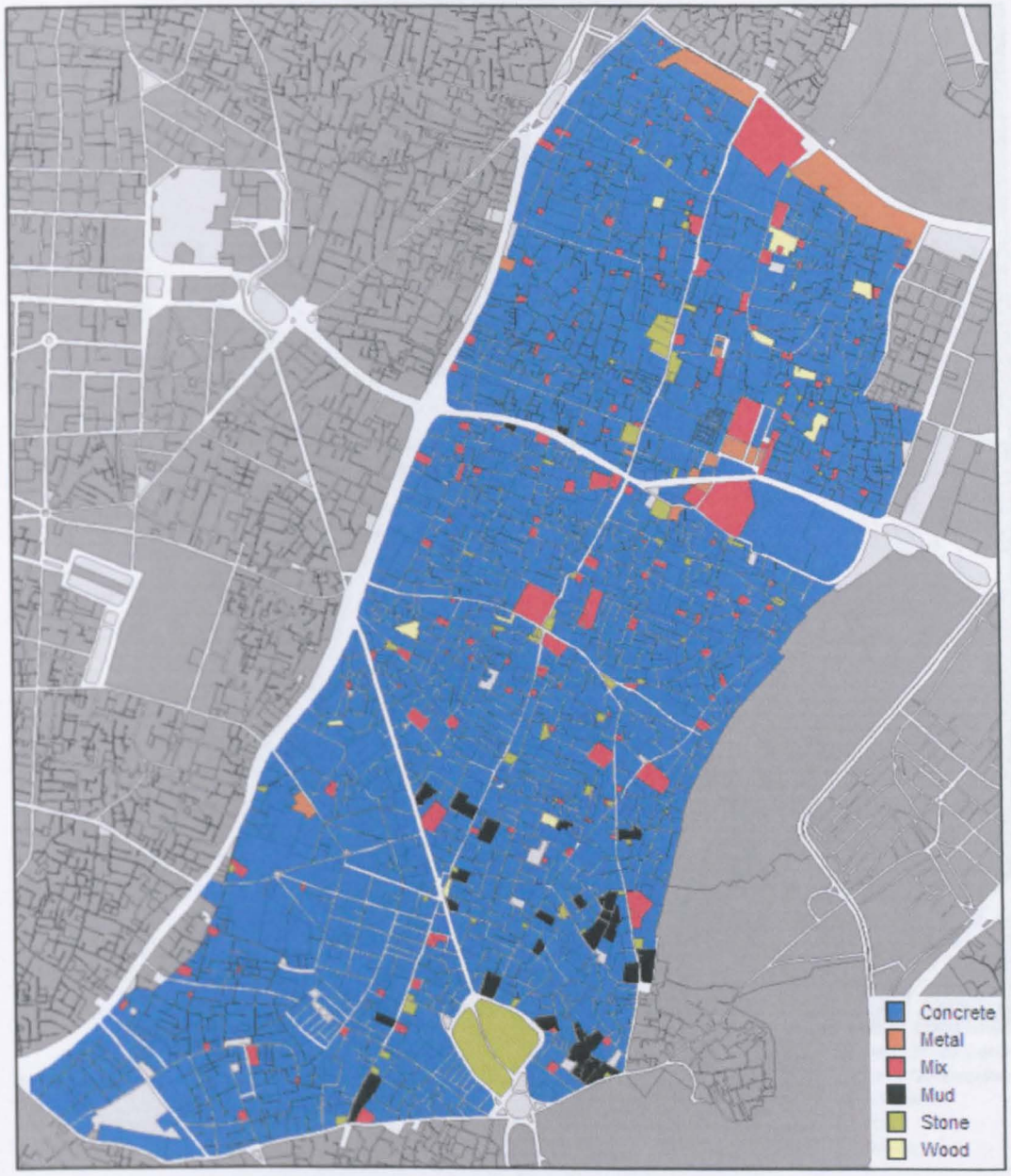


Figure A.4 Building Conditions in HC



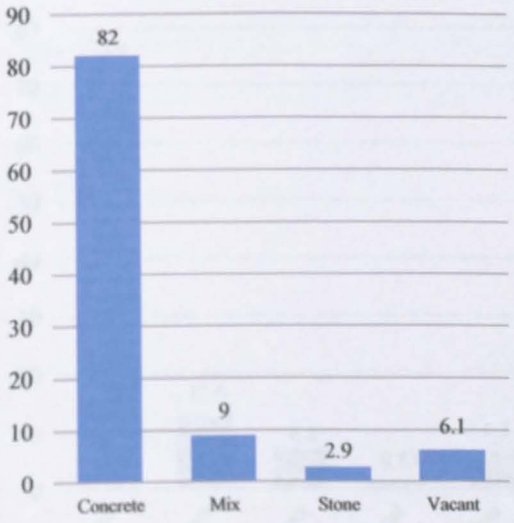


Figure A.5 Building Construction in HC

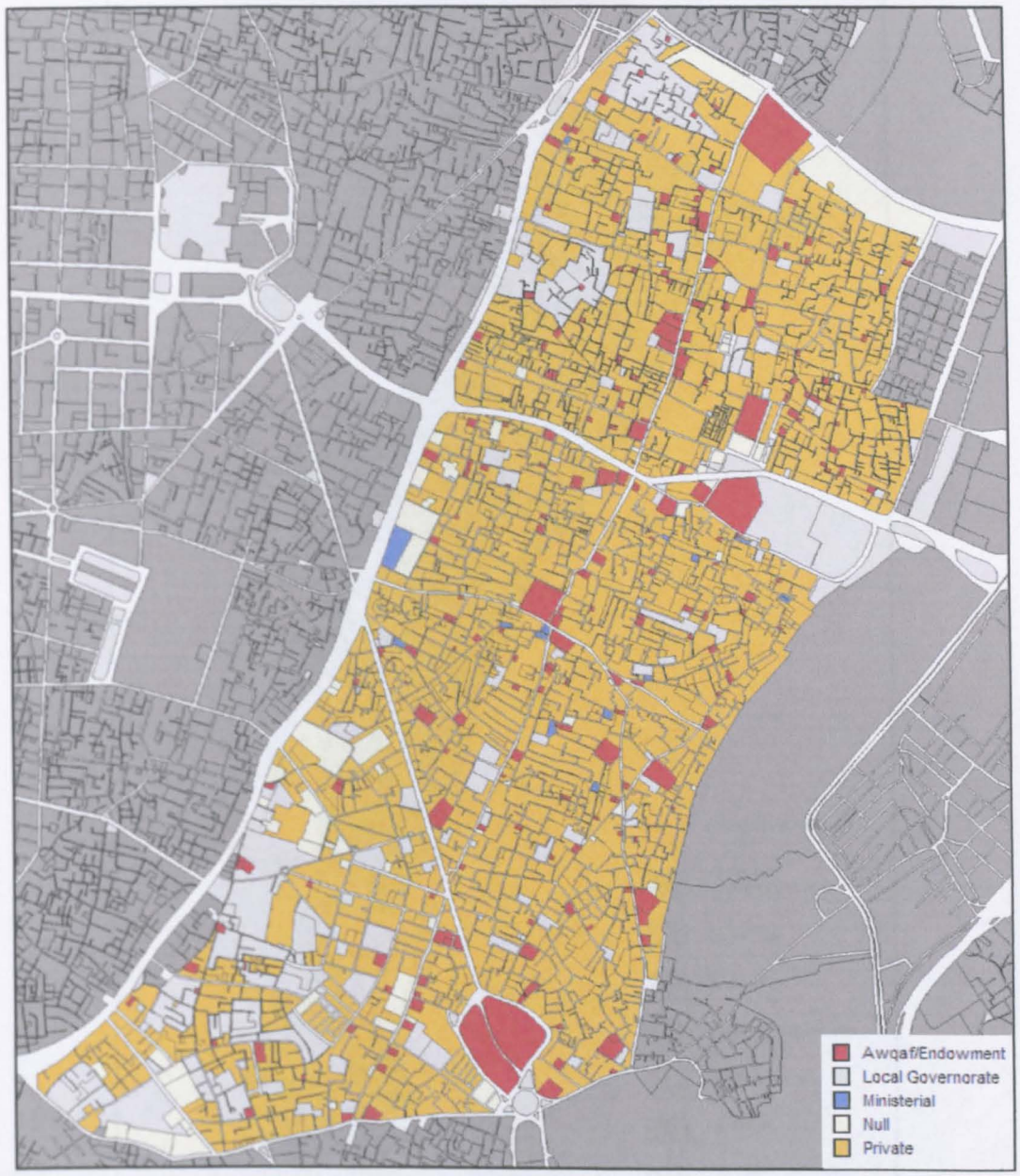
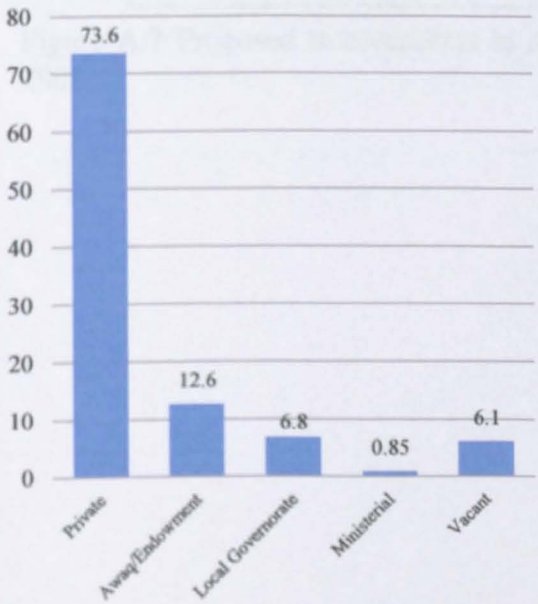


Figure A.6 Building Ownership in HC



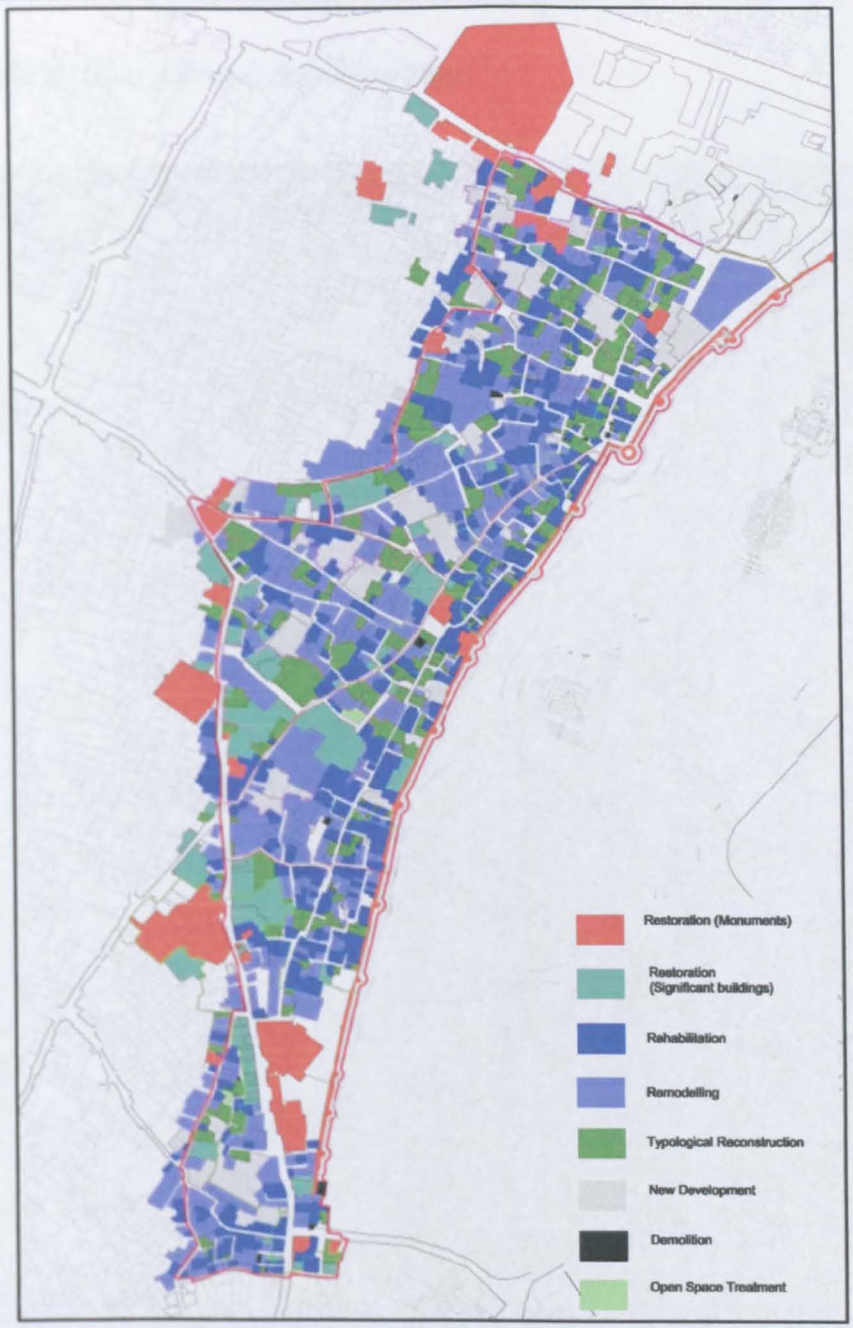


Figure A.7 Proposed interventions in Al Darb Al Ahmar (Bianca & Jodidio, 2007)

Appendix B: Space Syntax Analysis Maps

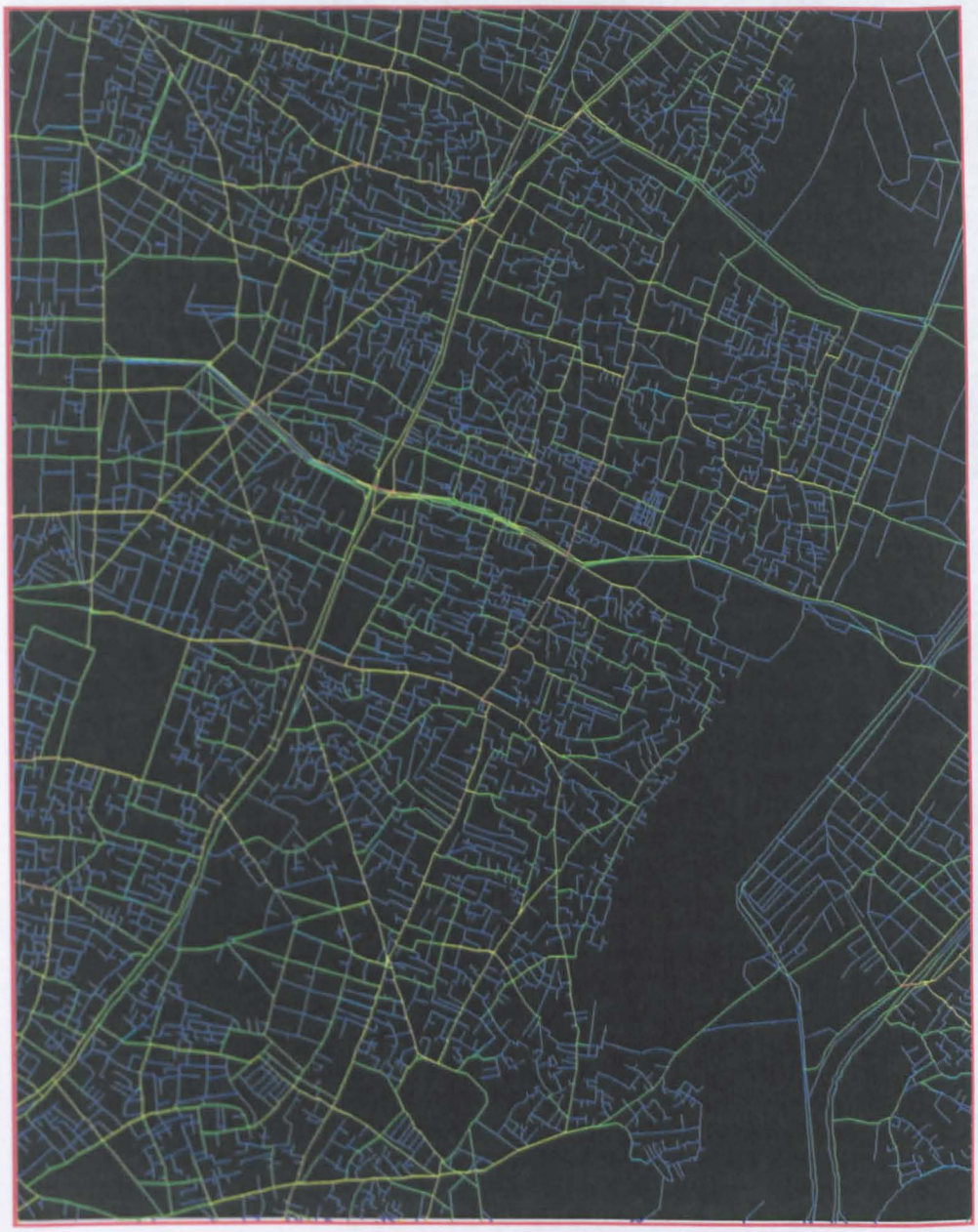


Figure B.1 Local accessibility choice (segment analysis) Radius R800 using depthmap software

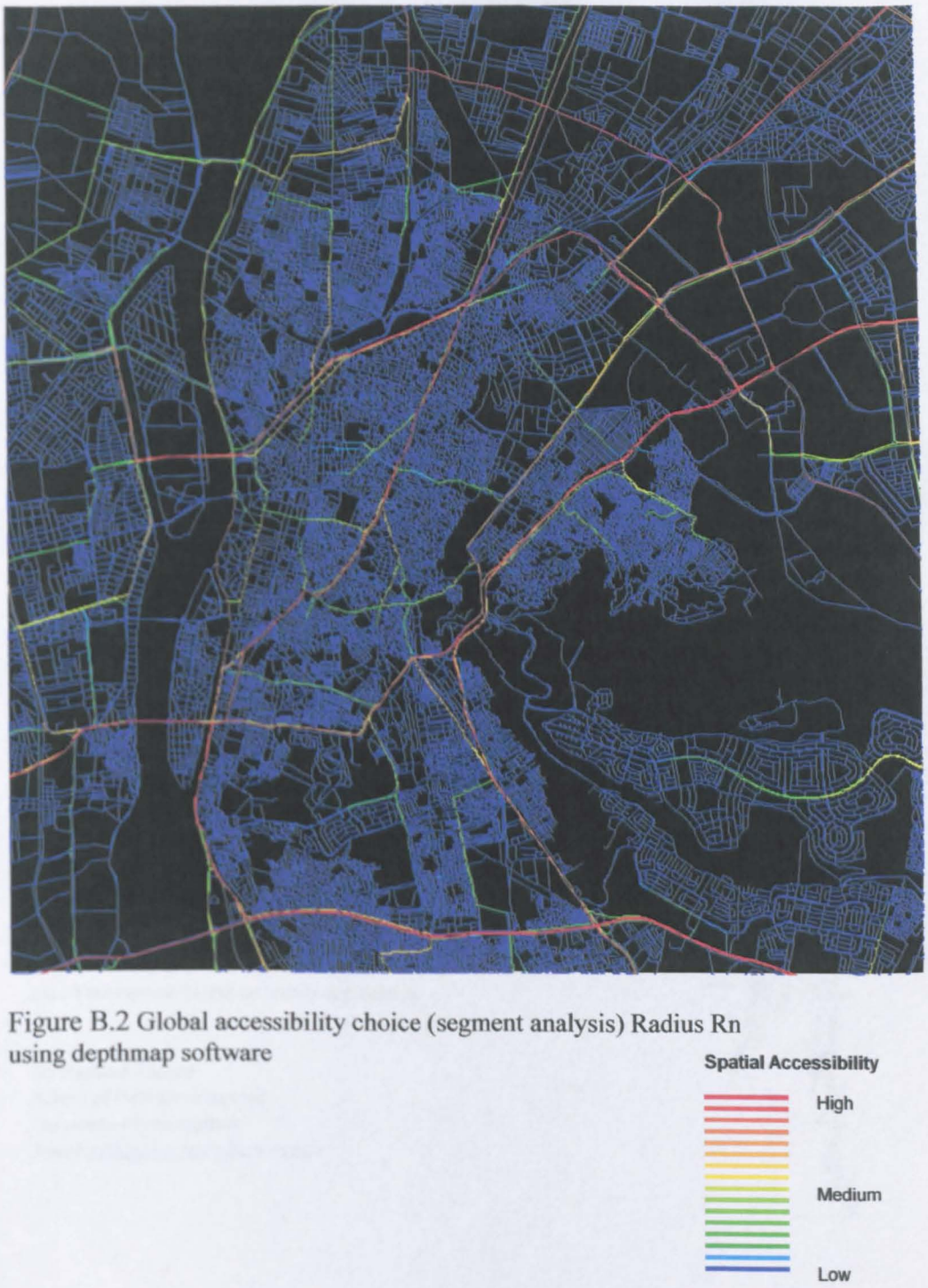


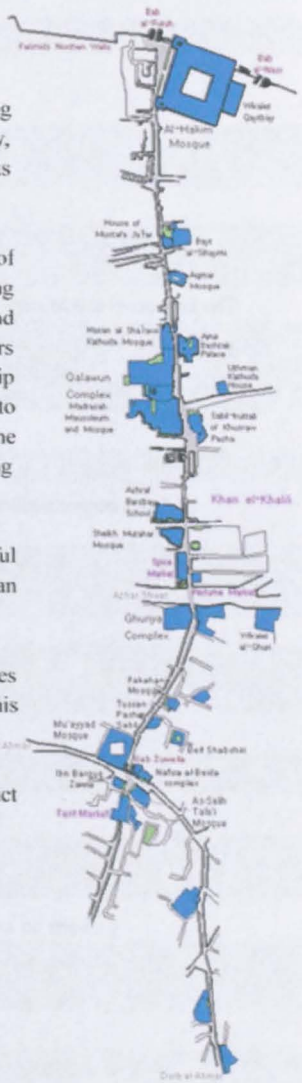
Figure B.2 Global accessibility choice (segment analysis) Radius Rn using depthmap software

Appendix C: Questionnaire Form

Appendix C: Questionnaire Form

QUESTIONNAIRE

The University of Nottingham



Dear all,

This questionnaire is designed to engage the community members in learning and understanding the problems and potentialities of their community, economic, social, environmental, political, psychological and all impacts associated with their wellbeing.

Questionnaires in the Historic Cairo (HC) will be used to establish views of community members, (NGO) members, and property owners also including the opinions of residents living in or close to it. It focuses on evaluatng and promoting active and positive participation enabling all community members to influence the decisions made for their welfare, thus enhancing leadership capacity of members and groups within the community. It also aims to incorporate the diverse interests and cultures of the community members in the development process therefore introducing a prposed scenario for achieving sustainable urban development in Historic sites.

The questionnaire should only take 10-15 minutes and will be extremely useful in the research of promoting community participation in sustainable urban development of heritage sites.

Your responses will be confidential and will be used for research purposes only. No individual will be identified as a result of completing this questionnaire.

If you have any questions or comments about this questionnaire, please contact me . Your comments will be greatly appreciated.

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PERSONAL INFORMATION

1- Name (optional) **Gender**

○ Male ○ Female

2- Age group

○ Less than 20 ○ 20-29 ○ 30-44 ○ 45-59 ○ 60 & more

3- Marital status

○ Single ○ Married ○ Widowed ○ Divorced

4- Employment status

○ Empolyed ○ Never been employed ○ Student-employed
○ Was empolyed ○ Student ○ Retired

5- Level of education

○ No degree ○ Secondary/High school ○ Diploma ○ Post-Graduate
○ Primary school ○ College ○ University degree

6- Which of the following stakeholder groups would you consider you are a member of?

○ The local authority / government ○ Retail ○ Local resident ○ Other (specify.....
○ Community action group ○ Property owner ○ Consultants/expert
○ Developer ○ Investor ○ Tourist/visitor

7- Do you live or work in HC?

○ Live ○ Work ○ Live & Work ○ Visit/ stop over

If your answer was "LIVE", answer the following questions, otherwise move to Q.10

8- How long have you Lived in this area?

○ Less than six months ○ 1 - Less than 3 years ○ 5 years & more
○ Six months to less than a year ○ 3 - Less than 5 years

9- What is the current status of your building unit?

○ Ownership ○ New rent law ○ Furnished rent
○ Old rent law ○ No rent (a gift/In kind privilege)

10- If your answer was "WORK", mention the job status

○ Permanent ○ Temporary ○ Seasonal ○ Occassional

11- If your answer was "VISIT", How often do you visit this area ?

○ Daily ○ Once a week ○ Every 1-3 months
○ 2 - 3 times a week ○ Once a fortnight ○ More than 3 months

12- Means of transport you frquently use to get to HC (choose one or more)

☐ Walking ☐ Bicycle/motorcycle ☐ Bus/underground ☐ Other (specify.....)
☐ Private car ☐ Microbus ☐ Never goes out

13- How long does it take you to reach your work/school ?

○ Quarter an hour ○ Half an hour ○ 45 minutes ○ An hour ○ More than an hour

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PROBLEMS & POTENTIALITIES

14- Do you consider this area a slum area?

○ Strongly disagree ○ Disagree ○ Indifferent ○ Agree ○ Strongly agree

15- How do you describe your general experience of this area ?

○ Very satisfied ○ Satisfied ○ Indifferent ○ Dissatisfied ○ Very dissatisfied

16- In your opinion, what are the potentialities in Historic Cairo? (choose one or more)

☐ Heritage corridor/street
☐ Landmarks/Nodes/Squares
☐ Spiritual life/sense of place
☐ Islamic monuments
☐ Urban character
☐ Other (specify.....)

17- What do you think are the most tangible problems in Historic Cairo ? (choose one or more)

☐ Living conditions
☐ Quality of life
☐ Insecurity of tenure
☐ Low family income/poverty
☐ Household overcrowding
☐ General Insecurity
☐ Crime & drugs
☐ Lack of health services
☐ Lack of social & leisure facilities
☐ Lack of education facilities

18- What do you consider the deficiencies in infrastructure?(choose one or more)

☐ Transportation & traffic management
☐ Electricity, telephone & internet networks
☐ Deterioration of streets/ pavements
☐ Absence of fire system & extinguishers
☐ Sanitary network/sewage system
☐ Solid waste management/ debris
☐ Water pipes and waste water
☐ Lack of parking spaces
☐ Groundwater
☐ Other (specify.....

19- What is your opinion about local transportation in this area?

○ Very satisfied ○ Satisfied ○ Indifferent ○ Dissatisfied ○ Very dissatisfied

20- What are the main land management problems within HC? (choose one or more)

☐ Conflicting ownership of plots
☐ No clear physical demarcation of plot boundaries
☐ Lack of or poorly maintained register of ownership
☐ Insecurity of tenure
☐ Lack of maps & plans
☐ Slumming
☐ Other (specify.....)

21- Which of these industries causes most disruptive pollution in HC? (choose one or more)

☐ Craft making workshops
☐ Aluminium & copper smelting
☐ Metal welding
☐ Timber yards
☐ Marble cutting
☐ Car repair yards
☐ Other (specify.....)

22- What are the main causes of visual pollution?

☐ Rows of shops obscure historical buildings
☐ Graffiti and vandalism of historic buildings
☐ Deterioration of existing residential buildings
☐ Inappropriate advertisment banners (builgings/on street)
☐ Distorted skyline
☐ Overcrowded streets & pavement
☐ Very narrow pedestrian paths
☐ Other (specify.....)

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23- What is the most dominant type of pollution affecting the area of HC? (Please rank them in order of importance)

	disagree				agree	order
Air	○	○	○	○	○	☐
Potable water	○	○	○	○	○	☐
Noise	○	○	○	○	○	☐
Visual	○	○	○	○	○	☐
Solid waste & debris	○	○	○	○	○	☐

24- Do you prefer to remove noisy crafts workshop?

○ Yes ○ No

25- If yes, Will that affect the identity of this area?

COMMUNITY PARTICIPATION

26- Can you identify effective impacts of NGOs in HC?

○ Often ○ Sometimes ○ Never

27- Can you mention the most efficient NGO targeting services for HC?

28- Have you been involved in any local organization during the last three years?

○ Yes ○ No ○ Don't know

29- If your answer was "YES", what is your responsibility(ies)?otherwise move to Q.30

○ Being a committee member ○ Raising funds ○ Training provision
○ Doing administratine or clerical work ○ Organizing events ○ Other (specify.....)

30- If your answer was "NO", are you willing to participate in a local organization?

○ Yes ○ No

31- In your opinion, who will participate in this local organization? (choose one or more)

☐ Political party ☐ Residents ☐ Purchasers ☐ Experts ☐ Other...
☐ Religious group ☐ Employees ☐ Tourists ☐ Investors
☐ Landlords ☐ Vendors ☐ NGOs ☐ Other (specify.....)

32- Please circle each following statement that best represents your views on historic Cairo

	Strongly disagree (1)	Disagree (2)	Indifferent (3)	Agree (4)	Strongly agree (5)
1- Spatial accessibility improvement is needed	○	○	○	○	○
2- Lack of pedestrian pathways and public spaces is problematic	○	○	○	○	○
3- Conflict of Interest hinders interventions in historic Cairo	○	○	○	○	○
4- Stakeholders are more concerned about their personal welfare than wider benefits	○	○	○	○	○
5- New affordable houses are needed in vacant plots	○	○	○	○	○
6- Development initiatives tend to plan for adaptive re-use of existing monuments and significant buildings	○	○	○	○	○
7- Existing local capabilities and resources should be used	○	○	○	○	○
8- Awareness among local residents of the cultural heritage of the area is to be raised	○	○	○	○	○
9- Insignificant and under-utilised buildings are to be demolished	○	○	○	○	○
11- Non-historic buildings need to be preserved	○	○	○	○	○

33- What do you think the attitude of the government towards participating of local citizen in local organization?

○ Strongly ecouraging ○ Ecouraging ○ Indifferent ○ Discouraging ○ Strongly discouraging

34- Do you feel that all stakeholder interests are equally important? Why?

○ Yes ○ No

35- Have you taken or considered taking any of the following actions to solve a local problem

○ Sent a complaint to local newspaper ○ Only thought about it ○ Other (specify.....)
○ Contacted the appropriate organisation ○ Courthouse ○ None
○ Joined an action group ○ Formal complaint

36- Why would the public be involved in urban development of HC? (choose one or more)

☐ Improve the existing situation ☐ Type of democracy
☐ Maintain human & quality of life ☐ Recognize & communicate the needs & interests
☐ Consider the future of HC ☐ Interact with the government. in making decisions
☐ Feeling of having been influenced ☐ Other (specify.....)
☐ Increase the sense of belonging

37- How would you describe the government intention towards developing cultural heritage site?

○ Very weak ○ Weak ○ Indifferent ○ Strong ○ Very strong

38- Can you influence decisions that affect your area?

○ Yes ○ No ○ Don't Know

39- What are your aspirations/concerns towards developing Historic Cairo?

Aspirations:

Concerns:

40- Finally, describe in your opinion what is most important to conserve in HC? Why?

Appendix D: Indepth Interview Form

Potentialities and constraints

1. What do you think are the most tangible problems in Historic Cairo? Describe the constraints and potentialities in this area?
2. What are your aspirations/concerns towards developing Historic Cairo?
3. How can practical solutions to barriers that have arisen in HC be sought?

Built environment

4. What are the most viable ways to preserve historic buildings in this area?
5. In your opinion, how can the non-historic buildings be preserved that no further degradation could occur over time?
6. What are the ways to maintain the urban fabric of Historic Cairo?

Infrastructure

7. How can the main deficiencies within the infrastructure of Historic Cairo be conquered?
8. What can be done to improve water, sanitation, and/or solid waste management?
9. How can the parking and congestion problems within Historic Cairo be resolved?

Social dimensions

10. How can the obstacles facing the household to the tenure fragmentation of their homes in Historic Cairo be overcome?
11. In what ways, how can the deficiencies within the basic social services (educational services, health services...) be resolved in Historic Cairo?

Local economy

12. In your opinion, what impedes economic development in Historic Cairo (e.g. training, loans of economic projects, transportation of goods, etc.)?
13. How can we promote, consolidate and strengthen the local economic development in Historic Cairo?
14. Which economic sectors do you think are on a growth trend? Which sectors are on a decline trend?

Development mechanisms

15. In your opinion, what are the main benefits that participation initiatives may bring to your community?
16. Which stakeholder group interests do you think should be considered as the most important? Why?
17. What do you think is the best method for ensuring that different stakeholder interests are taken into account and acted upon by the local authority?
18. What are the main problems in implementing participation initiatives? How can the above limitations be overcome in order to increase the level of community participation in the development process?

Development finance

19. In what ways can the financial problems for conserving historic Cairo be prevailed over? Is the cooperation between the involved parties and the government for implementing the strategic plan for conservation of this area may prove useful under the current fiscal downturn?

Appendix E: Interviewee Details

1. Housing and Building Research Centre (HBRC)

The responsibilities of HBRC are to provide consultancy services to Ministry of Housing, Utilities, and Urban Development. In addition, supply scientific research, technical development, and action planning in Egypt.

Interviewed Person: Prof. Suzette Michel Aziz, HBRC

2. Supreme council of Antiques (SCA)

SCA is the branch of the Egyptian Ministry of Culture. It is responsible for the conservation, protection, and regulation of all antiquities and archaeological excavations in Egypt.

Interviewed Person: Dr/Tariq Al Murri (UNESCO office, Cairo)

3. Aga Khan Trust for Cultural (AKTC)

AKTC is an agency of the Aga Khan Development Network (AKDN). It focuses on the revitalization of communities in the Muslim world in physical, social, cultural, and economic aspects

Interviewed Person: Dr/ Ashraf Kamel Botros (Senior Architect, Housing rehabilitation project, ADAA project

4. General Organisation for Physical Planning (GOPP)

GOPP was established as a state authority under the direct supervision of Minister of Housing, Utilities and Urban Development (MHUUC). It is responsible for drawing up physical planning policies, the preparation of physical development plans and programs, coordinating with public services plans and programs and the verifying the application of such plans.

Interviewed Person: Prof. Ayman Ibrahim El Hefnawi (Vice-Chairman, GOPP)

Collected Data: Old GIS Maps of Metropolitan Cairo, in addition to Income, Expenditure, and Consumption Survey

5. National Organization for Urban Harmony (NOUH)

NOUH is affiliated to the Egyptian Ministry of Culture (President decree 37/2001 for establishing NOUH). It aims at improving the visual image of cities, villages, and new urban societies. It is also entitled to remove any ugliness and any visual pollution. And preserve the architectural and urban features specific to every area.

Interviewed Person:

1. Prof. Sohair Zaky Hawas, Head of the Central Administration for Studies and Research and deputy chief at NOUH
2. Prof. Abbas Mohamed El-Zafarany, NOUH's Supervisor of Central Administration for Policies.

6. Center for Conservation and Preservation of Islamic Architectural Heritage (CIAH)

This private center is responsible for spreading the public awareness of the historical buildings and sites and preparing full documentation studies for the architectural heritage. In addition it provides consultant supervisions of conservation projects.

Interviewed Person: Prof. Saleh Lamei Moustafa, Director of the CIAH

7. Friends of Environment Development Association (FEDA)

FEDA is NGOs, its main duties is to achieve Sustainable Development for Al-Gamaliya district through implementation of projects leading to the upgrading of socioeconomic aspects with the goal of improving the quality of life of its residents.

Interviewed Person: Dr. Adli Bishay

8. N.A.D.I.M. Center

The center provides training of artisans and craftsmen in traditional arts. It is also involved in the preservation and restoration of 4 historical monuments like the 17th century area (Darb Al-Afar, Gamaliya district; Bayt El Suhaymi, 1648 AD., Mustafe Gaafar, 1713 AD., El Kharazati, 1881 AD., Sabil Kutab Qitas, 1630 AD).

Interviewed Person: Dr. Asaad Nadim and Nawal El-Messiri

9. **Ministry of Planning and International Cooperation (National Planning Institute)**

   Strategic planning policy in the national level is the main responsibility of this authority.

   Interviewed Person: Prof. Ragia Kheiralla, Consultant, National Planning Institute

Appendix F: AKTC Rehabilitation projects

Figure F.1 View of Al-Azhar Park, on the left Al Darb Al Ahmar while on the right Eastern Cemetery, Source:(AKTC, 2007)

Figure F.2 Al-Azhar Park, historic Cairo with a view of Salah El-Din Citadel, Source:(AKTC, 2007)

Figure F.3 View of Al Darb Al Ahmar and Al-Azhar Park, Source:(AKTC, 2007)

Figure F.4 Darb Shoughlan Street before and after AKTC rehabilitation

Figure F.5 Darb Shoughlan School rehabilitation